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FINANCIALTIMES

Wall Street's delayed reaction to money supply rise, Page 20

EUROPE'S BUSINESS NEWSPAPER

Monday May 23 1983

NEWS SUMMARY

BUSINESS

erations are divided over bow best

to tackle repayment of its \$84bn ex-

ternal debts. Page 2. Leading arti-

• CIVIL AVIATION: Further ef-

forts will be made at talks opening

in London today to improve Anglo-

U.S. relations. Price fixing and the

Laker Airways' conspiracy case are

Dieter Spethmann attacked successive West German govern

subsidised European competition.

• CURRENCIES showed little

overall change within the European

Monetary System last week. The D-

EMS May 20 '83

[[]][][]

cy, although it was comfortably

inside its divergence limit. Thurs-

en the current high level of U.S. in

terest rates. Hopes of an early cut in rates have receded in the face of

higher U.S. money supply figures, although there are still hopes that

some reduction may take place be-

fore the Williamsburg Summit. On Wednesday, EMS central rates were revalued by just over 1

per cent, although that left curren-

The chart shows the two constraints

on European Monetary System ex-change rates. The upper grid, based

on the weakest currency in the sys-tem, defines the cross rates from which no currency (except the lim) may move more than 2% per cent. The lower chart gives each curren-

The lower chart gives each curren-cy's divergence from its "central rate" against the European Curren-cy Unit (ECU), itself a basket of Eu-ropean currencies.

• CHINESE delegation arrives in

London for two weeks of talks with

UK Government and company offi-

cials, offering incentives for partici-

pation in oil projects in the Shen-

• WALL STREET analysts are

beginning to sound a more cautious

note after the slow response in in-

vestment attitudes following the re-

newed rise in M-1 money supply.

EUROPEAN truck exports will fail nearly 30 per cent this year, says the London-based DRI Europe

• EMPLOYMENT in the world is

the subject of today's special Statis-

• WHEELOCK MARDEN, the

Hong Kong shipping, trading, and property group, reported 1982 prof-its 84 per cent down at HK5192.4m

• BRITISH COLUMBIA Forest

Products is to reopen two big saw-

mills in July because of growing

U.S. demand and firmer prices.

tical Analysis feature on Page 5.

zhen region. Page 3

group. Page 3

(\$27.6m). Page 22

cy cross parities unchanged.

rates unchanged.

There appeared to be little

225%

Mark remained the weakest cur

likely prominent issues. Page 20

cie, Page 18

Page 20

GENERAL

Many die Brazil split over in new \$84bn Lebanon troubles debts

At least 23 people were feared dead BRAZIL'S leading business fed-after a wave of abductions by rival erations are divided over bow best Druze and Christian communities in the Shoul Mountains outside the Lebenese capital, Beirut.

More than 100 people from both sects were kidnapped at road-blocks. In Beirut, Lebanese Premier Shafiq al-Wazzan called oo Syria to withdraw its troops from the country to test the reliability of Israel's pledge to withdraw. Report; Analat seeks support, Page 2

In Israel, police held two suspects in connection with the murder three months ago of peace demonstrator Emil Grunzweig.

Doctors on strike

Seven thousand Israeli Government-employed doctors walked out of hospitals and clinics while the Cabinet met to discuss their pay

500 bombs thrown

About 500 petrol bombs were thrown at police in Bogside, Londonderry, early yesterday. It was the worst attack on police in that part of troubled Northern Ireland for several years.

Apartheld blamed

Archbishop Dennis Hurley, chairman of South Africa's Roman Catholic bishops' conference, said the Government's apartheid policies were largely to blame for the Friday bombing in Pretoria in which 17 people were killed. ANC warn-ing, Page 2.

Air show crash

A Canadian Starfighter exploded in the air at a U.S. military air show outside Frankfurt, and wreckage killed three adults and two children in a parked car. The pilot ejected

War deaths charge

1956, was flown from Toronto to West Germany to face charges of orderiog the deaths of 11,584 Lithuanian Jews as o Nazi secret police officer in World War II.

Turks' freedom swim

Six Turkish nationals, four of them Kurds, sought political freedom in Greece after swimming across the River Evros in Thrace.

Soviet music ban

Soviet cultural anthorities have banned the first performance, in Moscow, of an oratorio, The History of Dr Faust, by leading Soviet mod-ernist composer Alfred Shnitke. It is due to be performed in Vienna

Malawi deaths

Political struggles linked with the succession to President Dr Hastiogs Banda are believed to lie behind the death of two senior Ministers in Malawi. Page 2

Avalanche kills four

An avalanche hit the Italian town Teglio near the Swiss border, killing four people and injuring 19. Seven people were reported miss-

House to emigrate

Work starts today on dismantling a Southampton, England, house and shipping it to Bundaberg, Queensland, where Australian flying ace Bert Hinckler, who lived in it when working as a test pilot, plans to re-

Briefly...

Alain Prost (France, Renault) won the Belgian Grand Prix at Francor-

Palermo: Police have arrested 52 Mafia suspects in connection with a nationwide meat racket.

 NIPPON CHEMIPHAR, the Japanese drug company, lost Y1.8hn (\$7.7m) in the year ended March, af-Rome: Former Italian International Ginrgio Chinaglia has offered to buy Lazio soccer club for \$7m.

ter a Y1.34bn profit. Page 22 - CONTENTS -

Regan increases speculation over Volcker's future

BY ANATOLE KALETSKY IN WASHINGTON

Mr Donald Regan, the U.S. Treasury Secretary, added fresh fuel yesterday to the speculation that Mr Paul Volcker might not be reappointed as chairman of the Federal Reserve Board when his current term of office expires in August.

Mr Regan said in a television in- someone else who could do the job vote by the Senate in favour of a erview that, although President Ronald Reagan had not yet ad-dressed the issue, his decision would be based on three aspects of Mr Volcker's record as Fed Chairman. None of these three aspects nomic consultant and a former appears to stand in Mr Volcker's tavour, although Mr Regan did not

• THYSSEN chief executive Dr say that.
The first consideration would be the Fed's general performance un-der Mr Volcker. This had not acments for failing to protect the country's steel industry against corded with the President's desires until about nine months ago, Mr Regan conceded.

A second main factor would be the President's personal feeling of "ease in his relationship with Paul

According to most White House and Fed sources, Mr Volcker has never had a particularly satisfactory personal relationship with President Reagan. In fact, they have on-ly met face to face on a handful of recasions in the past two years.

1985 onwards, Mr Regan and other senior officials made clear over the

as well or better," the Treasury Secretary said. Mr Regan refused to speculate on alternative candidates, but Mr Alan Greenspan, the well known eco-

ic Advisers, would be the most likely, oo the basis of his past experice, to qualify on the last score. Asked about current monetary policy, Mr Regan also said he was "not alarmed" by the recent up-surge in U.S. monetary growth, although he was "concerned" about the Fed's inability to keep money supply on a steadier course. Never-theless, interest rates "could easily come down a point or two" further this year with the appropriate monetary policy and with action

The Administration will try to emphasise the budget deficits from

budget which was unacceptable to the President because of its tax increases, military spending cuts and high rete of non-defence spending. The confrontation with Congress will make it all the more important for President Reagan to persuade the nation that he is just as determined as the legislators to reduce budget deficits - but in his own way, according to White House strategists.

In order to prevent Congress, and particularly the Democrats, from seizing the deficits as "their issue," the President will remind the na-tion that he proposed large tax in-creases from 1985 onwards in his original budget, presented to Con-gress in February.

The crucial differences between the President and Congress, Mr Re-gan noted yesterday, were that the President would not allow tax infrom Congress in budget deficits, he creases this year to stifle an economic recovery and that he would not raise taxes simply to finance

decision would be "whether there is weekend. This followed last week's higher government spending. Mitterrand to consult Giscard before summit

BY PAUL BETTS IN PARIS

Divergence | | make a hrief appearance at the Elysee Palace this week after a two-year, absence from his old presidential home. His return appears designed to give greater weight to France's controversial proposal for a new Bretton Woods conference to lay the basis for a more stable intermed. The meeting this week in no way former president lags behind M suggests a sudden thawing of relations between the two men, but it minister, and M Jacques Chirace, assents to be more than a simple who is leader of the opposition as need to consult with M Giscard d'Estaing's position as need to consult with M Giscard d'Estaing's position as need to consult with M Giscard d'Estaing's position as need to consult with M Giscard a leader of the opposition in France.

The meeting this week in no way former president lags behind M suggests a sudden thawing of relations between the two men, but it day's meeting of the Bundesbank central council left key interest ational monetary sy for any downward adjustment, giv-

The former French president has accepted an invitation from President François Mitterrand, his old Socialist foe to whom he lost the election in May 1981. M Mitterrand will consult M Gis-

card d'Estaing on Thursday before flying to the U.S. to attend the summit of industrial world leaders at Williamsburg next weekend.
Until now M Giscard d'Estaing

has fletly refused to return to his nld presidential quarters. He has turned down three invitations, claiming he was not prepared to at-tend social or worldly gatherings at the Elysée. But the former president indicated be would be prepared to return to the palace if it were important for the French na-tional interest.

Mitterrand launched his controver-sial call for a new world monetary The meeting at the Elysee and sial call for a new world monetary

M Giscard d'Estaing's proposals for a return to a system of fixed parities were published last week in several European countries includ-

conomist in the UK. amsburg to hold a new Bretton splits in the opposition.

But beyond the international

M VALERY. Giscard d'Estaing will dent to consult with political lead- ago has significant domestic politi-

coincidence that a week after M largest opposition party, and the

conference M Giscard d'Estaing has the consultations oo a subject as proposed a similar conference to es- lofty as a new world monetary systablish a so-called World Monetary 'tem' could clearly help enhance the national stature of the former presi-

As for M Mitterrand, he appears to have everything to gain from flattering his old enemy. By helping to ing Le Monde in France and The strengthen M Giscard d'Estaing's position within the right-wing oppo-M Mitterrand is clearly hoping sition when his influence bas been that the backing of his old foe will on the decline, the President also seems to be attempting to maintain

The last thing the Socialists in France want is an opposition united manouevring before the Williams-burg summit, M Giscard d'Estaing's behind one leader, whether it be M Chirac - the strongest candidate at

At the same time, however, while first visit to the Elysée since his buit is traditional for a French presimiliating electoral defeat two years president Giscard d'Estaing-Thatcher maintains poll lead

BY PETER RIDDELL, POLITICAL EDITOR, IN LONDON

BRITAIN'S ruling Conservative there was still everything to go for. Party is maintaining its large lead He pointed out that during the Fet in the opinion polls with no evi-ruary 1974 campaign, the Liberals dence of any substantial advance ratings did not start to increase unby either Labour or the Social til the middle of the election. He ex-Democrat-Liberal Alliance as the pected an improvement in the Alli-general election campaign enters ance's share to be shown towards its second full week.

Labour's approach of concentrating pears to be a clear regional pattern its fire on the Government's policies with Labour receiving a more faon unemployment and the welfare vourable response in the North and state, or in the Conservative em- the Midlands than in London and phasis on branding Labour as ex- the South-East, where dissatisfied treme and irresponsible.

The Alliance campaign commit- frequent tee met in London last night but its The latest batch of opinion polls strategists do not believe a shift in confirms that the Conservative their approach is needed, despite share of the vote is being maintheir poll rating. They argue that tained in the 45 to 47 per cent the Alliance should benefit from the range, fractionally less an average bitter exchanges between the other than 10 days ago. The Labour share two parties.

er, said in a radio interview that generally in the 17 to 20 per cent

range in both cases hardly changed over the last fortnight.

About the anly comfort for La-bour is that the three most recent polls point to a slight improvement in the Labour share to around 35

A Harris Research Centre poll of 44 marginal seats for a television programme gives a Tory lead of 2 percentage points over Labour, compared with 6 points last week and 0.1 per cent in the 1979 election. This is still consistent with a 9 percentage point lead for the Tories na

A feature of all the polls is the continuing large number of don't knows. A Harris Research survey in the Observer newspaper yester day showed 14 per cent who were undecided, would not say or refused to vote, while a Marplan poll for the Sunday Mirror indicated 16 per cent don't knows and a further 4 per cent not voting.

Continued on Page 20

U.S. in talks on **Polish** sanctions

By Our Washington Staff

THE REAGAN Administration has been holding exploratory discussions with its European al-lies on the possibility of easing economic sanctions against Po-land. Some Administration officials say forther relaxations could follow President Ronald Resgan's decision last week to resume talks with the Soviet Union on a long-term grain sales

In recent discussions with European officials, Mr Richard Burt, the U.S. Assistant Secretary of State for European Affairs, is said to have revived the idea that sanctions could be dismantled on a step-by-step basis in response to any signs that the Polish re-gime is moving towards less re-pressive domestic policies.

The European allies have argued from the beginning of the Polish crisis in 1980 that the West's response should be based on a "earrot and stick" approach using positive incentives, as well as punitive measures, to put pressure on the Pelish and So-

President Reagan has been ad-ament in his public pronounce-ments since the lifting of martial law in Poland last December that this did not constitute a substantive improvement in the Polish

Officially, removal of economic sanctions against Poland still de-pends on three conditions: Lift-ing of martial law; release of po-litical prisoners; and a "dia-logue" between the Government, the Solidarity trade union and the Church. But some senior officials have claimed to detect a slight easing in the President's approach, and have argued in the past few days that the resumption of grain talks with the Soviet Union is a symptom of

"I think it is clear to everyone now that Poland is better off now it was two years ago or even a year ago," Mr Howard Baker, the Senate majority leader said after a briefing on Soviet trade held at the White House last week.
Other informed sources, how-

ever. are stance to Poland is still as un-yielding as ever, and point out that the National Security Council and the Defence Department may have a very different view of the matter from the "eyes" in the State Department. All agree that the Pope's forthcoming visit to Poland may be crucial in deter-mining the future approach of the U.S.

Nigeria nears accord on trade arrears

BY WILLIAM HALL IN NEW YORK

8523 B

NIGERIA bas made substantial will be maintained at previously progress towards converting up to \$2bo of arrears on letters of credit which the country owes international banks into a three-year loan. will be established to consult the This will be a key element in a comprehensive refinancing package aimed at easing the huge backlog of arrears on the country's trade pay-ments which are estimated at up to

Details of the package were worked out at a meeting in New York on Friday between Nigerian officials, U.S. banks and represeo-tatives of European banks involved in lending to Nigeria.

The main elements of the proposed package are:

 Existing arrears oo letters of credit will be rolled into a three-year medium-term loan to the Nigerian Central Bank. The extent of the arrears on letters of credit is uncertain, but they are believed to total about \$2bn, less than half Nigeria's total trade arrears, and are owed to about 20 banks; • It bas been made a condition of

the package that all the hanks tovolved must disclose their exposure Banks' lines of credit to Nigeria

debt rescheduling.

Details of the proposed package will be sent to all the country's Europeao banks this week. Provided all agree, U.S. bankers are confi-dent that a formal offer to the Nigerians on the basis of the package can be made within about three

agreed levels as the medium-term

A bank co-ordinating committee

Nigerians, the International Mone-

tary Fund and the World Bank to

determine how much in new loans if any is needed by Nigeria; and

The proposed three-year loan to

cover arrears on letters of credit

will be excluded from any future

loan is repaid;

weeks. The majority of U.S. banks, which are owed close to half of Nigerian arrears on letters of credit, had previously refused to support a European proposal which would simply have combined these arrears into a loan, with no conditions

The U.S. banks had argued that Nigeria's economic problems were Continued on Page 20

Pinochet faces new pressure from unions

BY MARY HELEN SPOONER IN SANTIAGO

pressure for change.

His speech et the weekend, which followed a nationwide protest nn May 11 in which two died and hundreds were detained, accused the Soviet Union of provoking the un-rest. "This is not a fascist government, hut a government trying to protect the country from totalitarianism," he said.

n leaders move was sident labour groups have joined power, was summooed, with two the command, and if others decide other moderate union leaders, to to take part, it could pose a pow-separate meetings in the Interior erful challenge to the Pinochet re- Ministry.

Geo Pinochet, who pusted the so-

CHILEAN unino leaders have cialist regime of the late President formed a national command to pur-Salvador Allende in a coup in 1973, sue a return to democracy after the is thought to enjoy the support of refusal of General Augusto Pino much of Chile's military high comchet, leader of the country's right- mand. Some officers are reported, wing military regime, to respond to however, to be deeply concerned about the country's ecocomic crisis.

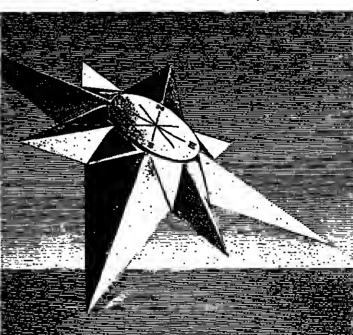
According to a plan approved hy a cootroversial plebiscite in 1980. Geo Pinochet is to remain in office

Ruling out any modificatino nf the plan in his speech, Geo Pino-chet criticised his supporters for failing to make their hacking plain. Those Chileans participating in the

spearheaded by the copper mine-workers, 10 nf whose arganisers Last week, Sr Frederico Mujica, have been charged with violating leader of the private employees' the country's state-security law after the May protest. Four other dis- the Pinochet regime when it took

> Future of Chilean airline in doubt, Page 4

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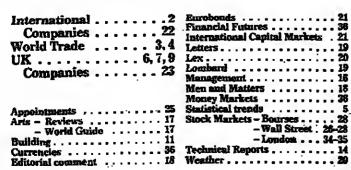
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Williamsburg: back to the Editorial comment: inter-UK venture capital: high- Lombard: why share prices Management: Saab-Scania Aerospace:

trans-Sahara Lex: business cable; oil route to recovery 16 Survey Section III

Leaders of all parties were yesterday reviewing their strategies
ahead of the June 9 poll. But there
is no sign of any change either in "don't knows." In addition, there ap-

references to the far left are more

two parties.

Mr David Steel, the Liberal lead-centage terms, while the Alliance is

MADRID - A speech in Brazil by King Juan Carlos of Spain has prompted a call for the resignation of Sr Fernando Moran, the Spanish

Foreign Minister. The speech, made by the king in Brasilia last week during his tour of Latin America, repeated part of an article by Sr Felipe Gonzalez, the Prime Minister, which appeared in the French publication Le Monde

Two Spanish newspapers, El Pais and Diario 16, yesterday devoted editorials to the address, the latter calling on Sr Moran to resign.

The Foreign Ministery plays a key role in the writing of the king's speeches on official trips, Diario 16

"How can people who listen to the speeches of King Juan Carlos be-lieve in their sincerity if they then discover the words were expressed earlier by someone else with a clearly defined ideology?" the news-

paper asked.
"It is o serious business which should lead to the resignation of the man responsible, who is none other than the ill-lated Foreign Affairs

In the repeated paragraphs, King Juan Carlos heralded the start of a new era of relations between Spain and South America and said the task of maintaining and developing existing links would be one of the cornerstones of Spanish foreign

The Latin American dimension is one of the fundamental objectives of the foreign policy of my country," he said.

No explanation of the repetition of Sr Gonzalez's comment was available from the Foreign Minis-

Crackdown feared in Argentina

LEADING Argentine politicians at the weekend publicly aired fears of a military crackdown amid a growing controversy over human rights in the country.

The military junts on Friday night issued a lengthy document alleging that members of the leading opposition party, the Peronists, along with human rights activists were organising a fresh outbreak of terrorist violence.

Warning that "May is an impor-tant month for the terrorists' plans," the junta also said it had uncovered plans to assessinate several trade union leaders and Sr Angel Robledo, a leader of the moderate faction of the Peronist Party.

federations are locked in a growing dispute over the need for a moratorium on payments or a further renegotiation of the country's \$84bn (£55bn)

Over the weekend, Sr Ruy Barreto, president of the Con-fedoration of Commorcial

fedoration of Commorcial Associations of Brazil, came out

in favour of a temporary suspension of debt payments to allow the Government to put its

eash flow back into equilibrium.

Sr Barreto was supporting o similar call made at the end of

last week by the National Con-federation of Industry.

Powerful opposition to this

view has come from the Sao Paulo State Federation of

external debt.

Brazil's business groups

in dispute over debt

BY ANDREW WHITLEY IN RIO DE JANEIRO

BRAZIL'S LEADING business of the question.

The document was a major departure from the cautious public profile favoured by President Reynaldo Bignone, and was reminiscent of the language used to justify the repression of political activity following the military takeover in

It drew a sceptical response from several political leaders. Sr Antonio Cafiero, a former Peronist economy minister, claimed that sectors of the armed forces were looking for an excuse to provoke a coup.

The junta's warning was issued against a background of the country's biggest ever human rights demonstration to protest at last month's official document on the

In New York last Friday, Sr

Ernano Galveas, the Brazilian Finance Minister, said reports circulating among Western bankers that Brazil would bo

forced soon to declare a full scale moratorium were "base-less." He also described suggestions of a new maxi-

devaluation of the cruzeiro as an "unmentionable idiocy,"

In a fresh effort to demon-strate to its foreign creditors that it is keeping its house in ordor, Brazil is expected this

week to announce further cuts in state company budgets and

"disappeared." Led by Sr Adolfo Perez Esquivel, a Nobel Peace prize winner, and leaders of the country's eight human rights organisations. some 50,000 people marched through central Buenos Aires before staging a mass rally outside the building of the Congress. Ar-

posed before the 1976 coup. Sr Esquivel, who was publicly supported by all the major political groupings, drew loud applause in a speech demanding justice for those guilty of human rights violations. In what was officially described as the last word on the issue of the

"disappeared," the junta last month

ment since a state of siege was im-

said that thousands of Argentines who had gone missing following the 1976 coup were now dead.

The military's tough stance drew renewed international protest at the weekend. Speaking in Genoa, President Sandro Pertini of Italy accused Argentina's generals of having committed "barbarous gentina has been without its parliacrimes" in their fight against terrorism. Sig Pertini said Italy had been plagued by left and right-wing terrorism for the last decade but had

not resorted to breaking the law. Relations between Argentina and Italy have been further strained following the alleged murder by secur-ity forces of Sr Osvaldo Cambiaso, a joint Argentine Italian national

Electronic cash link for seven Nordic banks

BY ALAN CANE IN LONDON

THE NORDIC banks, involving seven major banking institutions across three continents, are co-ophe warned, would be the suspension of oil supplies from abroad and the total collapse of erating to provide electronic corporate cash mangement services for

> It is thought to be the first time so many big banks have linked to provide an electronic banking ser-vice involving the transmission of information about their customers accounts.

> A corporate customer in New York will be able to use a televisionlike screen in his office to examine the state of his accounts in one or all of the banks in the Nordic group.

They include Copenhagen Han-delsbank, the Nordic American Industries, FIESP, whose presi- in stato company budgets and dent sald a moratorium was out sharp increases in domestic Banking Corporation of New York and the Nordfinanz-Bank of Zurich.

The "NordiCash" system has been installed by the UK arm of National Data Corporation (NDC), the U.S. computer services company which has already installed corporate cash management systems for the National Westminster Bank in London and Dresdner Bank in West

In the U.S., NDC has installed corporate cash management sys-tems for Manufacturers Hanover and Bank of America among oth-

Companies using NordiCash will be able to monitor their currency positions not only for domestic ac counts but for accounts abroad. In the future the system will allow payments from accounts abroad through the same terminals.

Mystery of Malawi deaths

By Our Johannesburg Correspondent

POLITICAL STRUGGLES over Malawi's Presidential succession are believed to lie behind the mysterious deaths of two of the country's most powerful ministers, reported in circumstances suggesting domestic confusion.

Mr Dick Matenje, secretary-general to the ruling Congress Party and Minister without Portfollo, and Mr Aaron Gadama, Minister for the Central Region, are said to have been found dead, supposedly in a car accident on the Malawi-Mezambique border, after Malawi radio bad broadcast a reward for

their discovery.
Reports reaching Johannes burg add that two or three other ministers may have either disappeared or been

kidnapped,
There has been speculation
about a failed coup, though
Blantyre and the capital
Lilongwe are reported to be
ontwardly caim.

Parliament was adjourned last week after the Life President. Dr Hastings Kamuzu
Banda, amounced that elections would be held next
month; the date was later
adjusted to June 29.
Dr Banda is in his 50s and the succession, although a taboo subject, inevitably looms large.

Mozambique reshuffle President Samera Machel of Mozambique has announced a reshuffle of several key ministers involved in security. and the beginning of a Gov-ernment overhaul to decentralise the bureaucracy,

and give a higher priority to agriculture, writes Queutin Peel, Africa Editor. Upper Volta arrests

Two Upper Volta arrests
Two Upper Volta ministers
and a trade union leader have
been arrested and accused of
fomenting anti-government
demonstrations, the ruling
People's Salvation Council
(CSP) said yesterday, Reuter
reports from Quagadougou.

Italian poll pledge

Guido Carli, governor of the Bank of Italy for 15 years and one of Italy's most respected financial figures, said yesterday he would stand for parlia-ment in next month's general election as a Christian Democrat, Reuter reports from Rome.

Sudan accuses Libya

A senior Sudanese official says Libya is belping mercenaries under its command to occupy a Chasian town with the aim of overthrowing the government of Hissene Habre, according to the Sudan News Agency, Reuter reports from

Cyprus anger

Tho Cyprus Government yes-terday accused Mr Rauf Denktash, the Turkish Cypriot leader, of trying to torpedo efforts to reach a solution to the island's dispute, Reuter reports from Nicosia.

FINANCIAL TBMES, published daily exceptional subscription of transfer and transfer to subscription of the subscription of the

Pretoria bomb is just the beginning, ANC leader warns

BY MICHAEL HOLMAN IN NAIROBI AND J. D. F. JONES IN JOHANNESBURG

the African National Congress (ANC), warned over the weekend that South Africa should expect repotitions of the Pretoria bombing as part of the intensification of his organisation's campaign against white

minority rule. Mr Tambo said he could not claim responsibility for the altack, in which 17 people died and 217 were injured, until he received reports from within South Africa.

"As soon as we are absolutely sure we will make a statement lo that effect," he said on Satur-

In South Africa, whites are in a trauma of shock and rage as they absorb the implications of the country's worst terrorist

It is now realised that the It is now realised that the toll might have been much bigher as bundreds of military personnel would normally gather in the street to await transport only minutes after the bomb exploded. The assumption is that the bomb had been tion is that the bomb had been prepared for them ond might bave gone off prematurely with the result that most of the casualties were civilians.

Mr Tambo declared: "The policy of the ANC (which is banned in South Africa) is to

latensify the struggle, attack the onemy, avoiding civilians where possible."

where possible."

where in Africa which might be within reach of South African retaliation.

Few people in South Africa which might be within reach of South African retaliation.

MR OLIVER TAMBO, leader of tion involves not just sabotage. but attacking the enemy

South African military raids on ANC offices near Maputo. Mozambique, in 1981, and ia Maseru, Lesotho, last December, in which civilians died, had prompted this change of

When asked whether the Pretoria bombing was an example of what might be expected, he replied: "Abso-

Mr Tambo was also asked if Western investment would be excluded from attack. He replied: "No. Foreign firms have become militarised. Foreign capital is now part of

South Africa's military might."
The first ANC reaction to Friday's blast came earlier on Saturday in a statement issued from its office in Lusaka, Zambia, which spoke of "an escalating armed struggle." The attack had been directed at a military installation, and casus ties were mainly air force and military intelligence personnel, it said. But the statement did not specifically claim responsi-

bility.

The ANC may be reluctant to make such a claim from any-where in Africa which might

the onemy, avoiding civilians where possible."

In the past, he said, the ANC and concentrated on sabotage determined to strike back at had concentrated on sabotage determined to strike back at of installations such as railways the ANC in as dramatic and and buildings. "But intensifica- forceful a manner as possible,

Arafat seeks support against Fatah rebels

BEIRUT—Mr Yassir Arafat, head of the Palestine Libera-tion Organisation, yesterday continued his efforts to contain a dissident movement among guerrilla officers by visiting Palestinian fighters in two refugee camps on the ouskirts of Tripoil in Lebanon.

Mr Arafat has made almost daily trips to PLO positions in Lebanon's eastern Bekaa valley over the last week to drum up support against a peaceful rebellion by dissident officers in his Fatah guerrilla group there.

Fatah moved to contain the rebellion on Saturday by order-ing five leading dissidents to be put under Mr Arafat's direct command and banning other PLO fighters from contacting them. A statement from the group's central committee also pledged to prepare for a Fatah cession to the dissidents who demanded such a meeting to air their complaints about Mr

Egypt has turned down a U.S. offer to pay for development of the Ras Banas military base on the Red Sea coast, and is to pay for the work.
Itself. The decision overcomes the problem of control
of the base, which had
raised the issue of sovreignty, writes Charles Richards in Calro.

The late President Anway Sadat originally offered the facilities to the U.S., but refused to allow R permanent

base there. Failure to resolve legal and procedural difficulties has now led the Egyptians to assume the task of doing the work themselves, even though this might take longer because of cash problems.

effect on the general conditions in Lebauon and the region as a whole will be of the utmost gravity," he told a Lebauese

their complaints about Mr
Arafat's leadership.
Mr Chafiq al-Wazzan,
Lebanon's Prime Minister,
meanwhile called on Syria yesterday to withdraw from
Lebanon and test the reliability
of Israel's pledge to pull out its
own troops.

"If for whatever reason there is no Israeli withdrawal, the

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WORLD TRADE NEWS

European truck exports 'to fall 30%'

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By Kenneth Gooding, Motor industry Corresp

TRUCK exports from Europe will fall nearly 80 per cent this year, dragging down production by 10 per cent, according to the latest forecast from the London-based DRI Europe

As a result manufacturers will concentrate more on Euro-pean markets, so there will be no let-up in the intense com-petition even though thera bould be some recovery in

DRI says the slump stems from the steep fall in purchases by members of the Organisation of Petroleum Exporting Countries (Opec) which in recent years have taken about 40 per cent of trucks exported from Europe. It points ont that the situation will have a greater adverse impact on the stronger manufacturers than their smaller

concentrating mainly on the European market, have aleady slimmed to meet the recession. It is their major competitors who now feel the pinch and are in consequence raising the pressure on the European market."

the report says.

The fall in export demand from beyond Europe will continue through 1984, DRI maintains. However, output in the five main EEC production countries should recover next year following three successive years

Output in the five countries (France, Italy, the Netherlands, West Germany and the UK) was 1.44m commercial vehicles of all types in 1980. It fell to 1.2m in the following year, to 1.17m in 1982 and is forecast to fall to 1.14m this year. DRI expects

the total to be up slightly at 1.19m in 1984.

Production in West Germany is predicted to fall from 366,000 last year to 342,000 in 1983 be fore recovering to 370,000 next year. For France the compara-tive figures are 369,000, 334,000 and 358,000; for the UK 225,000, 237,000 and 234,000; for Italy 149,000, 163,000 and 167,000; and for the Netherlands 11,000, 11,300 and 12,600.

11,300 and 12,600.
Summing up, DRI says: "A more broadly based recovery will begin in 1984,
"DRI European Trucks Forecast Report," 140 pages. Price \$1,400 or £800 from DRI, 30, Old Queen Street; London SWIH 9HP.

Richard Johns looks at the Trans-Sahara gas pipeline proposal

U.S. interest may not be enough

NOTHING could have been more predictable than the welcome given by Mr Donald Hodel, the U.S. Secretary of Energy, to the Spanish proposal for a pipeline linking Nigeria with North Africa and, ultimated Wast Europa mately, West Europe.

Tension between the U.S. and its European allies over the deal under which the Soviet Union would supply up to 40bn cubic metres of gas via the Siberian pipeline by the end of the decade may have eased with the decade may have eased with the lifting of Washington's sanctions against the project. But the Administration's hos-tility and concern over its Allies' dependence on Russian gas remains and the prospect of an alternative must look promising

promising. Nigeria is one of the more obvious sources of supply to meet the growing requirements of West Europe in the 1990s when indigenous output will be declining. It is, moreover, desperately anxious to get a return on its gas, which is now going to waste.

Nigeria is ranked 12th outside the Communist bloc in terms of proven gas reserves, a quarter of which are associated with oil output. About 90 per cent of current gas production is being flared. The Spanish proposal, put

forward at an International Energy Agency meeting in Paris earlier this month, is for a pipe-line running from Spain to Algeria through Morocco, crossing the Mediterranean at the Straits of Gibraltar. A branch line would then run from Algeria to Nigeria. INITIAL REACTION among senior Algerian officials to the pipeline proposal is very cautious, Francis Ghiles cautions, Francis Ghiles reports from Algiers, Algerian officials say they are inter-ested in the idea, but that many difficulties remain.

The Algerians point to the The Algerians point to the weak demand for energy in Europe, especially for natural gas. Spain last year only took 1.5bn cubic metres of the 4.5bn cubic metres of gas it had contracted to buy from Algeria and Italy will not be buying the full 12.3bn cubic metres a year which it has agreed to buy from Algeria before 1986.

Meanwhile the 20 per cent premium over market prices which the French have been paying for their Algerian gas per mBtns.

enstomer, Distrigat of Belgium is also negotiating a volume cut, in the amount of gas it had contracted to boy.

the two countries over the future of the Western Sahara will be easily or quickly solved. Either of the two routes proposed for the pipe-line therefore carries a risk,

The timing of Spain's initiativo was significant, coming only two months after the rapprochement between Algeria and Morocco—a development for which Sr Felipe Gonzalaz, Spain's Prime Minister, could take some credit.

It would almost certainly be more feasible to build a link to Spain across the Straits of Gibraltar from Morocco than over the far longer and deeper seabed route from the Algerian coast to eastern Andalusia will fall to 4 per cent on July 1 when the price of the gas declines to \$3.98 per million British Thermal Units. Spain is currently paying only \$3.40 Algeria's fourth European

The recent summit between King Hassen of Morocco and President Chadli of Algeria has led to a lessening of tension in North West Africa, but Algerian officials do not believe that the crisis between believe that the crisis between

for the security of the line.

nical difficulties, concentration had until recently been focused on a link between Bani Saf in Western Algeria and Almeria in Spain. Segamo—a joint venture between the Algerian state oil corporation Sonatrach, Enagas of Spain and Gaz de France—finished survey. Gaz de France-finished surveying a ronte in 1978.

Bechtel completed a feasibility study in 1981, concluding that it would be possible to lay a 120-mile pipecoast to eastern Andalusia hine at depths of up to 7,000 feet which has previously been studied by Algiers and Madrid.

Because transit across the Straits of Gibraltar bad been ruled out politically, while also posing as yet unappraised tech-

Gibraltar route, of 17 miles at a maximum depth of 900 feet, looks like a much better proposītico, especially on grounds of cost. Linking an Algerian-Spanish line to one from Nigeria also makes sense not only for Spain and France but also for Algeria.

The construction of a trans-Saharan facility would also enhance the possibilities of developing the gas resources of the in Salah region of central

The idea of a trans-Sahara The idea of a trans-Sahara pipeline was discussed in 1972 by the Algerian Government and ENI of Italy. In November, 1981 the same Bechtel, with an obvious interest in its implementation did an in-house analysis, concluding that such a pipeline appeared sufficiently viable to warrant further study.

According to Bechtel, a 42-inch facility powered by 56 compressor stations and with a design especity of 1.5hn cubic feet per day could be constructed at a cost of between \$8.5hn and \$9.6hn.

The lowest estimate related to the nost direct route across the centre of Algeria and tha highest to the one going via Morocco to the Straits of Gibraltar. It was reckoned that the project could yield a discounted cash flow of 19 per cent on the basis of a well-head price of \$1.50 per 1,000 cubic feet plus transit fees through the various countries.

Nigeria has oot yet expressed a view about the project. For several years, Lagos has been interested in a Liquefied



Natural Gas project under which 1.5hn cubic metres per day, 30 per cent of it associated with production from the Bonny oil field and 70 per cent massociated, would bave been processed for export.

In 1981, when the estimated cost of this project bad climbed to between \$10bn and \$14bn. purchasing commitments bad not been obtained and Nigeria ltself was running out of money, Phillips Petroleum and British Petroleum pulled out of the project. It was no coincidence that Bechtel did its analysis of the pipeline coocept at this stage. at this stage.

D. Little and First Boston are understood to be positive and Lagos clearly sets a high priority on going abead with a scheme that is more advanced than the pipeline idea. Purchasing commitments and financing beautiful to hear series. ing have still to be arranged.

Transporting gas to Western Europe via a trans-Sahara plpe-line might prove to be a more economically viable method and also a more secure one if it is assumed that the countries tra-versed have a vested interest in safe-guarding the facility.

At the same time, bowever, remains to be seen whether the Nigeria is now going ahead with another LNG project balf as large as the cancelled one. Technical and financial feasibility studies done by Arthur Algerian-Moroccan rapprochement, promising though it may be, has yet gone far enough for the project to be considered a serious possibility.

Chinese delegation arrives for oil talks

By Colina MacDougall

THE FIRST delegation to Britain from China's leading Special Economie Zone, Shenzhen, arrives in London today for two weeks of talks with government officials and

Special Economic Zones offer foreign businessmen lower tax rates and special facilities for investment which do not apply elsewhere in China. Shorizhen, one of four so far established, adjoins Hongkong and has attracted substantial investment.

The highlight of the mission's trip will be a briefing with offsbore eil companies in Eugland's north-east. Within Shenzhen, a special oil base is planned at Shekon on the west coast, to service the Sontb China Sea offshore oil industry.

About 20 British companies are expected to attend the hriefing at Stockton on Tees organised by the North East Development Council next Development Council next Thursday. These will include companies with experience in rig bnilding and equipment and in supply boats. China's offsbore industry is expected to start sbortly, following the award of the first exploration coutract to BP in early May. The delegation, led by the vice mayor of Shenhen, Mr Zhon Ping, was invited by the

Zbon Ding, was invited by the National Economic Develop-ment Council and is sposored by the Foreign Office. It will go first to the nerth east.

World Economic Indicators

INDUSTRIAL PRODUCTION (1975 = 100)% change Feb. '83 137.4 Feb. '82, 111.0 129.8 119.0 136.7 114.0 Feb. '83 113.6 Jan. *83 103.8 117.4 Dec. %2 103.6 118.0 +23 +1.0 -5.5 UK 108,1 115.0 118.0 112.5

Source (except U.S., Japan): Eurostat

SHIPPING REPORT

Improvement in crude cargo rates from Gulf BY OUR SHIPPING CORRESPONDENT

rates have generally tended in improve, reports shipbrokers E. A. Gibson.

Gibson pointed out, however, private basis with the details of grain shipments had been paid transactions impossible to confor at higher rates. Coal and

INDICATIONS are that there Galbraith Wrightson reports has been a steady increase of that transatlantic rates for coal, crude shipments from the Gulf grain and ore cargoes remained for both Eastern and Western relatively steady during the destinations and that shipping week with weaker teodencies in grain shipments from the U.S. to the Continent, Galbraiths cautioned that no clear overall market mood was discernable because Gulf-to-Continent grain that much of the ex-Gulf busi- shipments had been fixed at ness has been done on a very lower rates, while Gulf-to-Japan

Videotex deal for UK company

BY RAYMOND SNODDY

UK computer services company has won a contract to build and manage a videotex communications link between London and Stockholm for the Swedish Post Office.

From September, visitors to Swedish post offices will be able to call up pages of the latest financial and business information from London on the screens of Postel, the Swedish Post Office's videotex service. The two-year contract, worth

£500,000, has been won by InterCom Videotex (ICV), a subaldiary of Inter Commodi-

ties, the independent London first major international deal commodity brokers. Mr David Taylor, managing

director of 1CV, says the con-fract is essentially to manage a data base for the new Swedish service which will be called Postel International.

The Postel International database will be available throughout Sweden, Norway, Finland and Denmark, using the Nordie telecommunications network, Postel computers will have a 24-hour on-line connection with ICV.

The Swedish contract is ICV's exchange markets.

but the UK company already provides financial information for videtotex users in the UK West Germany, the U.S. and the Netherlands, 1CV manages Prestel's CitiService for British Telecom. The information provided for CitiService will be available to Postel but 1CV bopes that a local database will be built up.
This could include travel

timetables and booking systems, electronic banking and local financial information on the Stockholm stock and foreign

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WORLD TRADE NEWS

Clouds gather over Chile airline

CHILE'S national airline, Lan Chile, is undergoing an extensive study by government authorities to determine its future, after two years of losses totalling more than US\$75m, and with this year's losses

expected to be about \$45m. Lan attributes its problems to the general slump in the industry and to Chile's economic problems involving the devaluation of the peso. For the three years to mid-1982 the currency was fixed at 39 pesos to the dollar, but it has since fallen to 73.6 pesos.

The airline's fleet, meanwhile, is being reduced. Last year Lan sold one of its three Boeing 707s. It plans to sell the other two this year. This will leave the airline with four aircraft - two wide-bodied DC-10s used for the Santiago-Lima-Miami-New York routes, and two Boeing 737s used for shorter international flights and domestic flights. The Europe flights halt may be only the start, writes Mary Helen Spooner

its flights to Europe, which went of three Chilean security officials from Santiago to Rio de Janeiro, indicted in the case, but Chile has Madrid, Paris and Frankfurt. Lan has insisted that the suspensions were temporary, but it has closed its offices in Paris and Frankfurt. These closures triggered a strike in the Paris office.

The president of the Lan-Chile Workers' Union in Santiago, Sr Al-fredo Vila, said the airline had committed itself to handing out U.S.\$2m in severance pay to the 200 or so employees laid off by the cuts. Adding to Lan-Chile's headaches

is a suit filed by the widow of Orlan-do Letelier, the Chilean Ambassador to the U.S., who was assassinat-

DC-10s are leased from Air New ed in a car bombing in September Zealand.

The airline recently suspended cials have asked for the extradition refused. Earlier this year a U.S. federal judge in New York banned Lan-Chile from taking any of its holdings out of the U.S. until the Chilean Government paid \$2.8m in

> The ruling ended in legal confusion, however. Since the planes Lan-Chile uses for its Miami-New York flights are leased from New Zealand, the move had no apparent effect other than unfavourable publicity. The Lan-Chile flights between Santiago and the U.S. have continued without interruption.

touch of irony, given Lan-Chile's re-cent history and accomplishments. According to Sr Gustavo Guilerrez, the public relations director, the company changed itself from being a heavily subsidised and inafficient enterprise in the early 1970s to a profitable airline by 1980.

Lan-Chile won safety prizes in 1979, 1980 and 1981, and the Inter-

national Air Transport Authority (IATA) has given Lan-Chile a \$3 per cent punctuality rating, IATA has also ranked Lan-Chile among the top 15 airlines in the world in respect of productivity per employee on an airline mileage count.

Part of the problem with Lan-Chile's former European flights, Sr Gutierrez said, was the disadvantage it faced in competition with

Lan-Chile hopes to resume its Eu-The airline's problems have a ropean flights by 1985.

Timken order

after 33 years

THE U.S. Justice Department has tentatively agreed to lift a a 33-year-old court order which prevents

the British and French operations of Timken, one of the world's big-

gest producers of tapered roller bearings, from fixing prices or di-

The Ohio-based group is the big-

gest producer of roller bearings in the U.S. and the court order dates

back to a civil antitrust suit which charged that Timken had conspired

with British Timken and Societe Anonyme Français Timken to di-vide up the world market for anti-friction hearings. These are the

company's main product and used

widely in the world car and truck

At the time the order was filed

viding up the world market.

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Timken owned only 30 per cent of the UK company and 56 per cent of the French company. Since then it has acquired full control of both. and in the late 1950s they became divisions of the parent company.

Mr William French Smith, the

U.S. Attorney General, said on Fri-day that the Government's tentastipulation filed in the U.S. district court in Cleveland. The public have 60 days to comment on the propos

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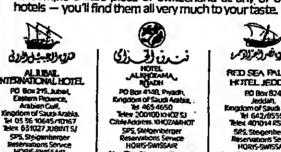
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Dan-Air introduces the new British Aerospace 146, the world's quietest jetliner



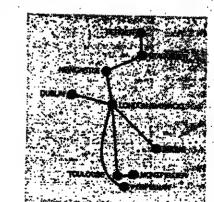
Today, Dan-Air takes delivery of Britain's newest airliner and the world's quietest jetliner, the British Aerospace 146. It will operate this 88-seat wide-cabin airliner initially on scheduled services between London Gatwick and Dublin, Beme and the South of France. Services from Newcastle to Gatwick and Norway will follow soon afterwards.

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For more details of Dan-Air services by BAe 146, call your nearest Dan-Air office or 01-680 1011.







STATISTICAL TRENDS: EMPLOYMENT

The grim spectre of unemployment

THE HIGH rate of growth forecast for the world labour force over the next 20 years carries a grim implication of rising unemployment. Even the industrialised countries, with lower population growth in prospect, seem certain to experience high levels of unemployment. With higher population growth, the developing countries face even greater difficulties.

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In the OECD economies the main change in employment structure over the past two decades has been the rise of the services sector. This has gone hand in hand with the gone hand in hand with the growth of governments' share in employment. On average, over the whole OECD, the governments' share grew hy 55.4 per cent over the period 1980-80. This figure hides wide differences between member countries with Sweden showing an increase of almost 21 times, while in the U.S. the government's share barely grew.

Participation rates are continuing to rise in most major industrialised economies. The major exception is the UK which recorded fells in each of the past two years. The

Commentary by Our Economics Staff: data analysis by Financial Times Statistics Unit; charts and graphs by Financial Times Charts Department

relatively low figure for Italy may be partly explained by its large proportion of un-recorded employment.

The relative dominance of large-scale industry is reflec-ted in the figures for employ-ment status. Countries with the highest proportion of self-employed tend to be those with relatively large percentages employed in agriculture, forestry and

agriculture, forestry and fishing.

The speed with which unemaloyment has grown in major indostrialised countries is a product not only of a decline in the number of jobs but also of sharply increasing labour forces as the 1960s "haby boom" comes of age. This latter trend will

continue through the 1980s becoming, perhaps, the dominant influence on unem-

dominant influence on unemployment levels.

The rate with which unemployment benefit replaces previous disposable income varies considerably. The "typical worker" is defined as a male production worker in manufacturing industry, married to a non-working wife with two children.

This definition is actually

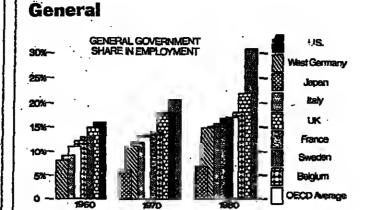
wife with two children.

This definition is actually untypical in a statistical sense. In 1980 it accounted for only 15 per cent of total unemployment in Finland and 10 per cent in the UK. The "average nuemployed" definition takes into account the high levels of youth and female unemployment, and where it is possible to calculate disposable income replacement rates on this basis, very different results occur. very different results occur.

Working hours are subject to the various influences of both long and short-term labour supply and demand trends. In the short term fluctuations in product demand are increasingly reflected in working hours, through overtime, shift work, etc. However, most indusetc. However, most industrialised countries have experienced a relatively strong decrease in annual working hours averaging out at about -0.7 per cent ever the past two decades.

Since 1970 part-time jobs have increased between two and four times as rapidly as total employment. The OECD estimates that between 80 per estimates that between 80 per cent and 95 per cent of these were filled by women (in 1977, 20-25 per cent of all women in the labour force worked part-time). Most of these jobs were created between 1970-73 (except in the U.S.); and in the following years the share of part-time jobs levelled off. More recently a new increase seems to have occurred. The proportion of jobs which are part-time varies between part-time varies between OECD countries from less than 10 per cent (Finland, Ireland, Italy) to over 40 per cent (Denmark, Norway, Sweden, UK) and is usually related to the Industry force. related to the labour force participation of women

Average	Approx C	Growth (%) Str	cture 198	(%)
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W. Ger.	4.6	0.1	2.5	-0.5	5.0	-0.6	3.7	0.3
France	-0.5	0.7	2.2	0.7	3.8	-0.4	1.8	-1.6
UK ·	-0.1	1.9	25	-0.9	3.1	-0.3	1.7	-0.5
Sweden	45	0.2	6.9	-0.5	3.6	6.6	1.7	-20
Austria	2.0	-0.4	2.5	-1.2	24	0.5	2.9 Source:	-0.7

PAS	RTICIPATIO	ON RATI	£*	
	%			
	1979	1980	1981	1982
U.S.	46.7	47.0	47.3	47.5
W. Germany	43.0	42.8	43.5	43.6
Japan	48.3	48.4	48.5	48.8
France	47-0	42.2	42.5	na
Italy	38.6	39.0	39.4	39.5
UK	47.0	47.1	46.8	46.4
Sweden	51.4	51.9	52.0	52.3
* Civilian labour	force as a p	roportio	n of popu	lation.
		Sources	: OECD, E	urostat

	,	& Self	Unpaid
	Employees	employed	family workers
U.S.	90.6	8.7	0.7
Japan	63.2	13.7	22.9
W. Germany	86.2	9.6	4.3
France	82.9		17.7
Italy	73.0	15.9	31.1
Canada	90.1	8.7	1.1
UK	96.7	3.8	~-
(reland	74.3	22.2	3.5
			Source: OECI

INDUSTRIAL STOPPAGES

Working days lost per 1,000 em-

ployees, all industries and services

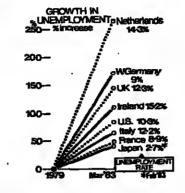
Annual average

1,713

North America

Japan UK France Italy Canada

1972-76 1977-81



1976-78

-0.15

~1.50

~1.06

~1.27

-- 1.08

--0.59

0.11

0.32

1978-80

-0.65

-0.43

-0.84

-1.53

-0.24

-0.89

-2.92

-2.33

Source: OECIL

ftafy

UK

Netheri

Hours and Earnings

1970-73

-0.35

—1*.4*1

-0.29

-1.62

-2.23

-1.53

-0.33

ACTUAL HOURS WORKED PER PERSON

IN EMPLOYMENT

% annual growth

1973-76

-0.70

-0.75

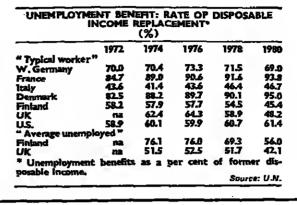
. — 1.12

-1.74

-0.58

-1.42

-1.24



WEEKLY HOURS WORKED

PER EMPLOYEE 1979

Industry

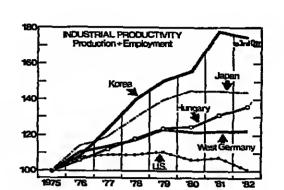
41.7

40.5

41.5

39.7

40.1



Women

W. Germ

France

Italy

* 1981.

UK

FEMALE SHARE OF EMPLOYMENT

AND UNEMPLOYMENT 1982

Employ-

39.0

38.4*

38.3*

32.5

ployment

42.1

38.2

44.3

57.1

55.6

35.5

Source: NECN

LABOUR FORCE EMPLOYMENT & UNEMPLOYMENT

1981

UK

Youth			
	UNEMPLOT March 1983 % of labour force of same age		DURATIO UNEMPLOYM EEC (9)
W. Germany France taly Netherlands JK Denmark Belgium	26.5 34.2 35.0 27.6 33.9 32.6	23.4 39.5 47.4 38.2 37.6 29.0 36.0	Under 3 month 3-5 month 6-11 months Over 12 month Total
FC (10)	74.4	36.8	

Source: Eurostat

1.6 1.7 3.5 1.5	41.7 41.7 38.8 40.6 38.9	U.S. W. Germany Japan France Italy UK	Earnings 4.83 3.97 2.66 2.71 2.33 2.64	6.35 6.19 3.05 4.58 4.60 3.27	Earnings & 8,50	ab cost 11.73 10.38 5.80 7.96 7.44 6.73
1.1	39.1	Korea	6.31	0.37	1,06	1.25
B.1 Source	39.6 e: Eurostat	Brazil Mexico * Provisional,	0.90 1.44 † Includ		2.98 1.97 ers' contrib U.S. Depr. o	
			N	lotor	Indu	stry
	URATION	OF YOUTH		EMP	LOYMENT	IN MO
	MPLOYME	NT AT OCT. 1	782		1977	1978
		% of total)	w	. Germany	5.5	3.6
Under	3 months		~ .	ince	9.0	0.7

4,776.000

Source: Eurostat

arnings 4.83 3.97 2.66 2.71 2.33 2.64 0.31

EARNINGS AND LABOUR COSTST IN MANUFACTURING

EMPL		IN MOT	% chang	e		
	1977	1978	1979	1980	1981	1982
W. Germany	5.5	3.6	2.7	1.8	1.8	0,1
France	8.0	0.7	-1.4	-3,6	-7.6	~29
Italy	0	1.3	4.6	0.7	-4.2	~49
UK	5.7	0.4	-24	—10.8	—17.7	-11.8
Belgium	1.4	1.3	3.8	-0.5	-9.6	~3.7
EEC (9)	3.3	1.7	0.7	-26	-7.1	-3.7
* First three q	uarters.				Source	: Eurosta



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assets of over US \$95 billion (as at December 31, 1982) Barclays is second to none when it comes to arranging export finance, and noted for particular expertise in the key areas of foreign local currency finance.

So whatever your interest in exporting, talk to Barclays first.

They'll help you come in from the cold.

Lloyds near to finalising Multi-Guarantee fund

BY DOMINIC LAWSON

stages of setting up a find to pro-tect the holders of extended war-ranties marketed by Multi-Guarantee, which went into liquidation last Friday. Manufacturers and retailers used

the Multi-Guarantee scheme to extend the normal one-year guaran-tee on household goods to four

The company directed its insur-ance through a non-Lloyds broker, which passed it to a Lloyds broker, Robert Morris Bray, which traismitted the premiums to Lloyds un-

The fund, which will comprise monles paid as premiums to Lloyds underwriters, is intended to provide

£29m telex

STC wins

contract

By Jacon Criep in London

tal of £59m of these terminals from

the old electro-mechanical telexes.

ties încluding a visual display screen which has a number of facili-

group, plans to simend its product

The company currently employs

which the Lioyds working party in-vestigating the allair completes its He added The working party will

It is thought that the working party, annutheed last month, will take another two to three months to

deliver its findings.
Lioyds said yesterday "there has been talk of the fund being worth about £5m. That seems rather on the high side."

Lloyds began its investigation of warranty scheme, when it was dis-covered that documents sent back to underwriters had been changed,

try to find out if Lloyds has done anything wrong in terms of our own

went on last year at Minet and Howden, we have got to be seen to

and the terms altered.

A Lloyds spokesman said This involves the Office of Fair Trading and the Department of Trade.

BA to reorganise Shuttle services

BY ELAINE WILLIAMS IN LONDON

major reorganisation of its walk-on flights to Edinburgh two indulths London-Scotland Shuttle services ago. Since then it has captained in the light of continuing losses of passengers to rival services.

In February, Mr Colin Marshall, gers on its Scotlish services, and STANDARD Telephones and Cables has won a £29m order from British Telecom to supply it with electronic telex terminals. In the last 15 months BT has ordered a to-

passengers to rival services.
In February, Mt Colin Marshall,
BA's new chief executive, set up the
Marketing Policy Group to look at
ways in which BA could improve its customer services. It was no secret at that time that

The demand for advanced telex terminals (teleprinters) has been very strong since their introduction in the UK. The teleprinters are the Shuttles were under scruting with their very basic service to passengers losing out to newcomer British Midland Airways alterna-tive, which is £5.50 cheaper than BA's £58 fare and which offers pasmuch quieter and easier to use than STC supplies BT with the Chee-tab, which has a number of facilisengers cooked breakfasts or other meals and a bar service on Scottish ties including a visual display screen which can be used like a Until BA's monopoly of the Scot-tish routes was ended last year fol-lowing British Midland's successful word processor. Trend, a company based in High Wycombe, also sup-plies BT with teleprinter, which is

application for an operating licence sold as the Puma. To date Trend has received £15m orders from BT. • Burroughs, the U.S. computer under the Government's 'open skies' policy, BA made an operating profit of about £5m on all its Shuttle development plant at Livingston in Scotland, which is expected to in-crease employment by at least 200 jobs over the next two to three This has been cut dramatically by British Midland's entrance and the

existing rail competition and by British Caledonian's flights to Scotland from Getwick Airport. British Midland started flying the

Heathrow and Glasgow routes last

BRITISH AIRWAYS is plaining a October and introduced scheduled

more than 2m people on its four Shuttle routes.

Among the possibilities the Bribish Airways think tank are studying to win back its lost customers
are the introduction of a meal and
bar service, a reduction in fares to
bar service, a reduction in fares to for passengers to book seats in and tend to support this view. vance so ending the concept of a walk on service, and an end to the payment of fares in flight. BA remains cautious about its op-

tions for the Shuttle services and denies that there is any likelihood that the services will be scrapped altogether.

On Wednesday a new airline will

enter the top end of the air travel of need, so that savings can be market. It is Birmingham Breuer tive Airways, which will begin daily services to Milan, Copenhagen and Zurich in June. These routes were the main foundation for Sisewell B given up by British Airways in 1982. in April 1985 and the commission

THE Central Electricity Generating Board's case for Sizewell B pressurised water reactor (PWR) has emerged bruised but still intact after the first 16 week term of the public inquiry, which now moves to

Sizewell

inquiry

moves to

London

though the eventual losses may involve no more than Sim."

Multi-Guarantee went in in liquidation voluntarily on Friday, at the request of its ahareholders. With the support of Lloyds the Official Receiver was appointed as it.

main after of challenge.
On a construction test basis, the PWR at £1.147bn compares favourably with the coal fired plant, at

ably with the coal fired plant, at \$1.24550 and would be considerably chebyer than an advanced gas cooled reactor, at \$1.5950.

The capital costs of the PWR and the coal fired station are likely to move closer together as a result of delays and the expense of design changes for Sizewell B, more of which may be necessary to stringly the Nuclear Installations inspectorate (NII).

the Nacional Installations inspective rate (NII).

But the CEGB has possible out that the net effective costs of the three options must be seen in the light of many other factors, including running costs, waste disposal, decommissioning and fuel costs.

A larger ways of the CAGARTS are

A large part of the CEGE's economic argument for the PWR is based on forecasts of rapid rises in

meet British Midland, the facility has suggested and recent forecasts However, the CEGB also believe that a diversity of fuel supply is a

powerful economic argument for a muclear choice. The CEGB admits that the new stations will not be needed for several years on capacity grounds, but believes it will be an advantage to construct the station in advance

the main foundation for Sizewell B profit on these routes by using 18 1992.

seater Jetstream 31 twin turboprop

Executive aircraft. BA used 99 seatworking to reselve a large number
of safety issues.

We fly more people to more countries than any other airline.

UK NEWS

Forecasts fail to beat the market

By Jeremy Stone

The state of the s

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Contractor de Contractor

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FOREIGN exchange forecasting services in the UK do not seem to be very successful in helping their customers to "beat the market." In most cases, according to a study in the City University's new Economic Review investors would do better review investors would no better - if they were to follow a passive policy of buying and selling in the forward market on the principle that the forward price ought to be the best predictor of future spot prices.

The international working party on exchange market intervention set up after the Versailles summitrecently found that "readily accessi-ble information on inflation and in-terest rate differentials" gives a better predictor of spot rates than do forward rates. So it looks as if there could be something badly adrift in the British forecasting services studied by the City University Business School.

The six major forecasts studied were almost uniformly bad at pre-dicting correctly whether the cur-rency would go up or down, and al-so at getting on the right side of the market (so that the forecast and the eventual spot rate are both more, or both less, than the forward rate).

Flipping a coin would tend to pick the right direction of change half the time, but over a three-month horizon only one forecaster managed a 50 per cent record in even a single currency (the Yen) out of the five being forecast. The overall per-formance of the forecasts was dis-

For a forecast to be used profitably in opening forward positions it has to be on the "right side" of the forward rate. But results here were also disappointing, with today's spot rate being the best predictor of the spot rate a year hence for every

curreocy except the Italian lira. On the other hand, the margin of error in the forecasts was sometime respectably small. Even though the worst of them was likely to be 10 times as far from the target as the three-month forward rate (for ster-ling-dollar rates), the best were able to beat the forward rate over a twelve-month horizon. However, the researchers point out that this is chiefly due to a deterioration in the forecasting accuracy of the for-



Short-term recovery predicted in engineering

end of 1984.

But the latest mechanical engineering short-term trends, published today, stress that "the forecast increase in output during the next 18 mooths will no more than make up for the reduction in output which has occured in the last 18 months.*

Under the forecasts contained in the trends, output volume in the final quarter of next year would be at the same level as in the first quar-ter of 1982. The forecast level of output volume for 1984 is about 18 per cent below the 1979 level.

Mechanical engineering output trends have been almost continual-

trends working party warns that "this short-term recovery does not necessarily imply that the tonger term downward trend has been halted."

The working party - consisting of employer, trade union and Government representatives - bases its assumptions for mechanical engineering on the view that UK manufacturing as a whole will increase by about 3% per cent between 1982 and 1984, compared with a reduction of 15 per cent between 1979 and 1982.

So far as individual sectors are concerned, the working party ex-pects substantial growth in output in instrument and electrical engineering, and possibly printing and publishing and chemicals. By con-

MECHANICAL engineering output 1976. While the forecast now sug-is forecast to increase by 7 per cent gests a period in which the trend from the middle of this year to the will be upward, the short-term marine engineering and less severely in the metal manufacture and textile, leather and clothing

The working party expects the re-cent low level of export volume to pick up and possibly lead to an in-crease in the volume of export shipments between 1983 and 1984. It has modified previous pessimistic statements about export potential to the oil-producing countries, and now believes that their demand for UK mechanical engineering prod-nots will not decline as seriously as was feared.

Mechanical Short Term Trends, subscription only. Engineering Em ployers federation London

Unemployment 'could halve' says new economic study

cording to Professor Michael Beenstock and his colleagues at the City University Business School.

They say this will happen because a spontaneous recovery in employment and output is in prospect, as real wage growth moder-

labour market.

This view is embodied in a new

Savings

receipts

still down

TOTAL net receipts from Nationa

Savings in April were an estimated 1792m, including accrued interest. This is £58.6m higher than in March, but falls well short of the av-

erage monthly inflow in the last fi-

The main net contributions to funding came from fixed-interest

National Savings Certificates (£114m), National Savings income bonds (£50m) and National Savings

Premium Bonds made a net cootri-bution of £10 and the NSB ordinary

By Jeremy Stone

nancial year of £246m.

account (£7m).

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pieces per month.

BEFORE the end of the 1980s the rate of unemployment in the UK is likely to be halved whoever wims long run the level of output depends the general election next mooth, ac- more on what producers find it profitable to produce than on the

held to be mostly the result of influences depressing the supply side, when rapid increases in the cost of ates in response to slackness in the rising exchange rate kept profitability at very low levels, reducing the This view is embodied in a new private sector's desire to produce, model of the UK economy, which By comparison with these forces, concentrates more than most previsary the Beenstock team, the de-

Aurora financial reconstruction plan to be redrawn

BY RAY MAUGHAN

PLANS which had reached an advanced stage for the £20m financial reconstruction of Aurora, the Sheffield-based engineering, castings and forgings group, will be redrawn this week following a substantial undershoot of the aid envisaged from the public sector.

Details of a reconstruction package were expected to be announced this week, but it is now understood that the Department of Industry has committed only the minimum aid required under the Industries Act 1971.

The private sector participants, which are believed to include the National Coal Board Staff Superannuation Scheme and Finance For Industry among half a dozen lead-ing institutions, had hoped that the department would extend, or "stretch" the provisions of the Act and commit about £2m to the scheme. Instead, the Government has decided to provide only £250,000 in grants and special aid.

This decision was described last week as a "psychological blow" to the private sector in relation to joint City and public sector re-financing proposals for industrial companies. It contrasts sharply with the formation fast year o Sheffield Forgemasters from the special steels divisions of both the British Steel Corporation and John-

son Firth Brown. On that occasion, it was eviden that the public sector was quite pre-pared to lead the way while the con-tribution from City of London insti-tutions was much delayed and only committed towards the end of the

negotiations in piecemeal sums. Aurora has a severe balance sheet deficiency. Under the terms of the Companies Act, 1980, it was required to seek shareholders ap proval for a substantial increase is its borrowing limits in anticipation of the equity and grant transfusion from the consortium of City and De partment of Industry interests.

CSI and banks to meet on disclosure rules

The banks believe that unless the owners of the various holdings are clearly acting as a "concert party" to gain control of a company, they should oot be required to disclos their holdings.

The Association of Investmeo Trust Companies, one of whose members claimed a large bolding of this kind was being used to exer pressure on it, bas called for a stricter interpretation of the rules on acquisitions of shares.

Swire Pacific Limited

Final dividends for the year ended 31st December 1982

Scrip Dividends

The average last dealt prices of the Company's shares on the stock exchanges in Hong Kong on which the Company's shares are traded, for the five trading days up to and including 20th May 1983 were:

> A shares Bshares

HK\$ 12.37 _2.05

In a tetter to shareholders trom the Chairman dated 6th May 1983, it was announced that the recommended final dividends for 1982 of 52.0c per A share and 10.4c per B share will take the torm of scrip dividends to be satistical by the Issue of additional A shares and additional B shares respectively, but that shareholders will be able to elect to receive dividends in cash in respect of all or part of their shareholdings. If was further announced that enlittements to fractional shares will be disregarded and the benefit thereof will accrue to the Company.

Applying the average last deall prices noted above, the number of new shares which shareholders will receive in respect of their existing shares for which elections to receive cash are not deposited by 27th May 1983, either with the Registrars in Hong Kong, or with the Registrars' Agents in the United Kingdom, will be

For A shares: Number of new

Number of existing x 12.37 A shares

be received For B shares: Number of new

Number of 0.104 existing x B shares 2.050 be received

and will be rounded down to the nearest whole number of new shares, fractionat entitlements being dis-

Subject to the approval of the recommended final dividends by the shareholders at the annual general meeting of the Company to be held on 27th May 1983, certificates for the new A shares and B shares in respect of the scrip dividends, which witt rank pari passu with the existing issued shares of the Company, and the dividend warrants in connection with the cash dividends, will be despatched to shareholders on 10th June 1983.

By Order of the Board

JOHN SWIRE & SONS (H.K.) LIMITED Secretaries

Hong Kong 23rd May, 1983

Swire Pacific Limited The Swire Group

What happens when you give a big customer too much credit?

You could be buying sales at far too high a price. At the time, it may all seem perfectly normal and sensible. All bad debts were good debts once ... or you would never have taken them on.

What happens when that credit doubles in three years?

On the statistics, your risk from other people's credit failure is probably twice what it was three years ago. Have any of your other business risks doubled in the last three years?

If they did, you'd check the insurance. Wouldn't

Send for the figures, as soon as you get to the office. Scribble a note on the margin, now, to remind you. Or tear out this advertisement.

What happens when it reaches 40p in every £ of your current assets?

40% is the average. In some companies it will be less. In others it will be more: the risk will be higher. It is the risk insurers call 'The Great Uncovered', because its sheer size is almost unbelievable at first. But it is true enough.

And the risk is real. Over 210 businesses fail every week: that's one every ten minutes of a working day.

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When you give credit, it is like investing money in somebody else's business. The larger that investment is, the more you need to protect it. Credit insurance and only credit insurance is designed to do this.

When your credit gets too big, it absorbs money which you could use in your own business. It costs you expansion, opportunities, jobs. Credit insurance can help to correct this. It can tighten up your whole financial operation. It can never make a bad business into a good one.

But it can make an efficient business more efficient. Last year, Trade Indomnity insured over

£13 thousand million of business credit. This is the back-up you get, as a Trade Indemnity client.

Take the first step here and now! Ask your broker: ring 01-739 43fl and talk to Charles McCartan: or send him this coupon FT23/5/B Trade Indemnity ple. Trade Indemnity House, 12-34 Great Eastern Street, LONDON EC2N SAX Please tell me what kind of service you could offer to my business, NATURE DE BUNNESS COMPASY

mand side effects of tight money since 1979 Took ordinary." BY CHARLES BATCHELOR For this reason, Keynesian policies for expanding demand are re-THE Council for the Securities Ingarded as inappropriate means for bringing about prolonged recovery; dustry (CSI), the City's main self-reamount of output demanded. gulatory body, and representatives and was not deficient. of the merchant banks will try again oo Wednesday to agree rules for the disclosure of substantial The model is intended to give projections over a long period, and varboldings by the banks in compalous scenarios are set out, running labour, energy and capital, and a The two sides disagree over bow the banks should treat shares, beld The Economic Review, City University Business School, Frobisher Crescent, Barbican, in discretionary accounts for clients, which add up to 15 per cent

Industrial plants and heavy pieces up to 70 gwt accepted. Please send your enquiries to the above address

A FINANCIAL TIMES SURVEY

JUNE 23

The Financial Times is proposing to publish a Survey on Gold in its issue of 23rd June to coincide with the Financial Times World Gold Conference -The outlook for Gold and Silver. The provisional editorial synopsis is set out below.

1. Ietrodoction The Gold market prospects for Gold price movements in the year ahead, etc.
2. Gold in the World

London bullion brokers Colns

8. Mining shares

Copy date June 10

For further information and advertisement rates please contact:

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money behind it, on every credit risk; smoother cash-flow; easier access to new finance. Trade Indemnity take the big risk. You don't.

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Don't sell your Tilling shares. BTR should not profit from Tilling – you should.

STAY WITH TILLING AND PROFIT.

We have already announced a 1983 forecast of an increase in profits to £95 million.

We will be writing to you soon with an encouraging statement on the 1984 outlook and proposals for a further increase in dividend income.

Also the financial restructuring of certain UK and US interests will provide for direct benefits to Tilling shareholders.

DON'T BE TAKEN IN BY BTR.

BTR are trying to panic Tilling shareholders into selling before the next Tilling defence comes out this week.

That's because they know it will show that the companies in the Tilling group are worth far more than the latest BTR offer.

BTR know a good company when they see one.

But they shouldn't profit from Tilling - YOU SHOULD.



Don't sell Tilling short - don't sell Tilling at all.

Tebbit spells out more employment changes

BY JOHN LLOYD, LABOUR EDITOR

MR NORMAN TEBBIT, the Employment Secretary, has spelled out tries and services as "essential" and MR NORMAN TEBBIT, the Ema further series of sweeping the requirement in these services to changes in employment law to take stick to procedure agreements on effect if the Conservatives win the

tions given in the Conservative manifesto, published last week and stressed his belief that in the event of a Tory victory, the trade unions would "do some fundamental re-thinking" on their present attitude

He repeated his willingness, first stated last December, to "move over" if it was "thought after an election that for the unions to come to a rapprochment, they should talk to someone other than me." He mentioned Trade and Industry and the Home Office as preferred choices of department - hut said that he would enjoy carrying for-ward the considerable legislative programme planned for employ-

This will include: The need to hold strike ballots not necessarily postal hallots but "fair and free" - before any union calls a strike, whether local or na-

If there were no ballot unions would lose immunities granted un-der section 29 of the 1974 Trade Unions and Labour Relations Act, and their funds would be at risk, we wouldn't want to wreck a politi-

stick to procedure agreements on pain of loss of immunities. Mr Tebhit said that the number of essen-Mr Tebbit enlarged on the indica- tial services or industries would probably be "narrowly drawn" - but could include the public and private

BRITAIN

GOES TO

THE POLLS

legislation to ensure that union

members have "effective choice" on

payment of the political levy -

though Mr Tebhit said that "if the

put these abuses right there may be

cal party lightly." Earlier possibili-ties of bringing in state aid for parties now seem remote. will require periodic endorsement probably once every ten years - by union membership in a ballot.

> • The granting of a right to all union's governing body by ballot. The right would be permissive, not prescriptive - "if it were abridged or denied it would be for the trade an action in the courts."

Mr Tebbit is not attracted to legislation to allow companies to off workers without pay because of the effects of strikes elsewhere in industry - though he says he will keep it in reserve if the industrial ralations climate deteriorates. He also presently does not favour legislation to decentralise wages, preferring the route of privatisation of services or parts of services - as the National Health Service.

unions are willing to talk on how to no need to legislate."
He said that "the simple and Of his period as Employment Secretary, he said that he was able to introduce changes because "public clean-cut solution would be to re-turn to "contracting in" to the politiopinion was ready for them -though I helped to create that opincal levy (presently a member must "contract out" of payment) but we ion. A lot of people had been notic-have listened to what the Labour ing that the emperor had no clothes

Fears on competitiveness lead to NEDC document delay

BY JOHN LLOYD

THE NATIONAL Economic Development Committee's controversial review of economic performance. publicised by Mr Neil Kinnock, Labour education spokesman over the weekend, is indeed an exceptionally gloomy document.

The document shows that: • unemployment, roughly the same as the OECD average until 1979, took off sharply since then, increasing by 75 per cent compared with the OECD average of 33 per

• the UK invests less than its competitors, and its capital produc-

• unit labour costs have risen sharply compared to competitor es, especially between 1977

velopment is lower than in any oth-

• the UK Government spends less on education and training than any other major European country.

pear unchanged or have even worsened during the Government's term of office, stand in contrast to Conservative claims that an upturn

However, Mr Kinnock, who has reportedly only seen the minutes of the March NEDC meeting which discussed the review, appears only half right about the status and future of the document, and all concerned with the NEDC have exssed surprise that it should have become such a live election issue.

First, it is a review of post performance, stopping at 1982. In some respects, it offers small bits of cheer as in the section on unemployment, which notes that the UK rate of increase in 1982 was lower than the

on productivity performance has been barely half the OECD average.

It also shows that wage inflation has fallen sharply since 1980, and has fallen sharply since 1980, and that the annual rate of change is equal to that of the U.S. and West

Germany. Second, while it is a fact that Su Campbell Fraser, President of the

These trends, many of which ap-my that people would want to get the first bost out of the country," it appears that there has been no de-

liberate attempt at suppression. The document had been agreed at staff level by Government, CBI and TUC, but the tenor of it caused the CBI to push for a two-month delay, while the NEDC staff added recommendations, to it on what should be

done to improve performance. These recommendations should have come to the Council meeting earlier this month, but were annar ently not prepared in time - a fact which is not thought to have caused great dismay among any of the

NEDC's partners.

The minutes of the meeting show that Mr Geoffrey Chandler, the NEDC's director general, expres concern that a document which had been agreed at staff level should be "called off at a higher level." Howas can be ascertained, appears to have been the CBI's fears of its efthan Government fears of its effect on a forthcoming election.

Alliance

outlined

MR Roy Jenkins, the leader of the

He insisted that an agreed in-

comes policy would be essential if

unless Mrs Thatcher

A Financial Times

servey to be

amblished on

Jaly 18, 1983

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Nigel Pullman

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terms

By Peter Riddell

Labour pledge on U.S. N-bases

The existence of a political fund

DISCUSSIONS aimed at securing the introduction of a new strategy for Nato would precede any decision by a Labour Gov-erument to close United States nuclear bases in Britain, Mr John Silkin, Labour's Sha Defence Minister, stated last

Insisting that there was no question of U.S. forces being given their marching orders to leave Britain as soon as Labour Ministers took office, be declared that nobody in his right senses would decide such issues overnight.

Mr Silkin, replying to ques-tions in a television programme on nuclear weapons policy, sed: "There are always discussions and there are always Mr Michael Heseltine, the De-

ience Secretary, accepted that there was "very serious unease and anxiety about the whole nu-clear issue" but claimed that the overwhelming mass of voters in Britain still supported the policy followed by successive British Governments since the Second World War, based on membership of Nato and the need for "a noclear backing" for the conven-

Dr David Owen, for the SDP-Liberal Alliance, warned that the negotiations with the Soviet Union, in which the Nato powers sought an arms reduction deal, which made it unnecessary for U.S. Cruise missiles to be deploy-ed in Europe, would be "tough." He underlined his preference for Nato adopting a nuclear weapons policy based on "no ear-ly use" rather than a "no first OPINION POLLS STILL GIVE THE CONSERVATIVES A FIRM LEAD

Charting the parties' progress

BY PETER PULZER

IS IT moving or isn't it? It sounds like the Inquisitor's question to Gal-ileo, and the best one can do is to opt for the ambiguous mumble that the great man thought it prudent to offer to his termenters.

In the middle of last week it locked as though there was some movement there seemed to be more single-figure opinion poll leads than double-figure for the Conservatives over Labour. How-ever, the 13 per cent Marplan lead in yesterday's Sunday Mirror and the 15 per cent MORI lead in the Sunday Times, appear to have put paid to that, compared with only one single-figure lead, the 9 per cent recorded by Harris/ORC for

There are a number of difficulties in discotangling these clues. The first consists of comparing like with like. The order of publication does not always coincide with the order of field work; MORI's interviews, for instance, were done on Tuesda and Wednesday, Marplan's oo Friday. The frequency with which each organisation takes its polls also varies, and since addicts have come to know each of the organisations' little idiosyncrasies one should ideally compare one NOP with an-

As an example, during the 1981 surge for the Alliance, Gallup tended to report somewhat higher ratings for it than other polls, but the trendlines were on the whole parallel Moreover, Gallup, unlike its rivals, often asked an "Alliance offering Liberal and SDP choices, which generally produced slightly different answers. So the safe thing to do was to compare Gallup with Gallup and not to draw one graph with figures from every organisa

OPINION POLLS RESULTS								
Poll and date	Sample	Cons	Lab	SDP Lib	Others	Çons lead		
Range of eight taken								
May 5/12 1983 MORI (Standard)		45/52	31/38	15/21	9/2	8/21		
May 5/11 Geffup (Telegraph)	1,824	46	32	22	0	14		
May 11/16 MORI (Star)	946	46	33	19	2	13		
May 16 Audience Selection	1,090	44	37	17	2	7		
(TV-am) May 16 MOP (Mail)	1,154	46	31	21	2	15		
May 16/17 Audience Selection	1,584	49	31	19	1	18		
(Sun) May 17 MORI (Express)	507	44	33	21	2	11		
May 19 Harris Research (TV-Eye)	1,100	46	37	16	1	9		
May 17/18 MORI panel (Sunday Times)	1,053	45	35	17	3	10		
May 17/18 Harris Research (Observer)	960	47	30	21	2	17		
May 19/20 Marpian (Sunday Mirror)	1,052	45	36	18	1	9		
May 20	1,250	47	34	18	1	13		
General Election May 3		45	38	14(LIb)	3	7		

A further obstacle is that there is more than one method of choosing a sample. Purist statisticians prefer be one four years tater. random sampling (i. e. taking every 500th name on the electoral register), but this is slow and expensive. Most polls now use quota sam-

Recently telephone polling has come back into favour, after a loog period of discredit. Telephnoe poll ing got a bad name in 1935 when the Literary Digest of America. baving polled its members, forecast the defeat of Roosevelt, having got the result right four years earlier. Since readers of the Literary Digest and telephone users were predomicantly middle class, what had been a politically representative sample

ples, which leaves more discretion

to the individual interviewer.

before the New Deal had ceased to

However, a telephone poli forecast the result of the Bermondsey by-election quite accurately. The reason for this may be partly because most people now have tele-phones, but also because polling organisations now know how to compensate for any distortions that their methods may introduce.

Bearing this is mind, it is possible to trace the movements of opinion in the first ten days of the camthe gap between Labour and Con-

tively good local government election results, however, has come to

This is likely to give little comfort to the opposition parties. But opin-ico polls ask more than "how would you vote?" questions, and the answers to some of these are a little more cheering to Labour and the

The Liberal/Social Democratic Party Alliance parties have always argued that it is campaign exposure that will give them the lift in the polls that they expect, as did indeed happen in 1964, 1974 and 1979, when the Liberals' ratings rose substantially in the final stages of the campaign. Alliance voting intentions at the moment remain obstinately flat, hut their leaders' ratings have risen perceptibly, as, to a lesser ex-tent, have those of Mr Michael Foot, the Labour leader.

On issue handling, the message is more mixed. The Alliance shows small rises on six issues, including unemployment and public services Harris: Weekend World) and on the EEC and defence (MORI). Labour is also up on unemployment and pub-lic services (Weekend World), but topics according to MORI. But both polls report the Conservatives gaining on a greater number of issues than either of the other parties.

What the verdicts on issues signify is a general hardening of commitments as the campaign progresses, rather than shifts in alle giance. The proportion of electors who have still to make up their cording to all the poils that ask that paign. Thus it appears that since question. That leaves both Labour the announcement of the election and the Alliance fewer votes to play for - unless of course, those who servatives bas narrowed slightly, think they have made up their while the Alliance's position bas remained unchanged. The earlier La The author is tutor in Politics bour surge, which gave it its rela- at Christ Church, Oxford.

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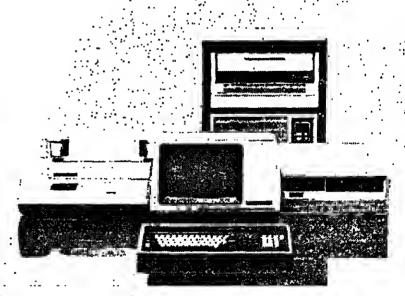
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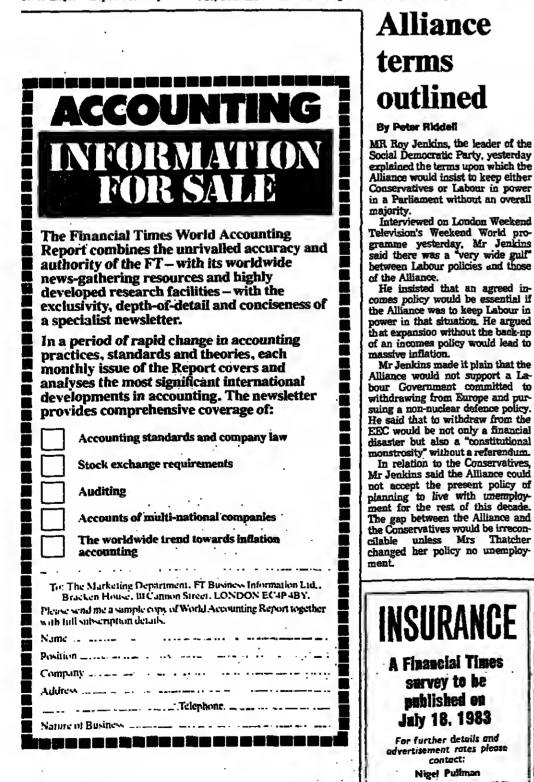
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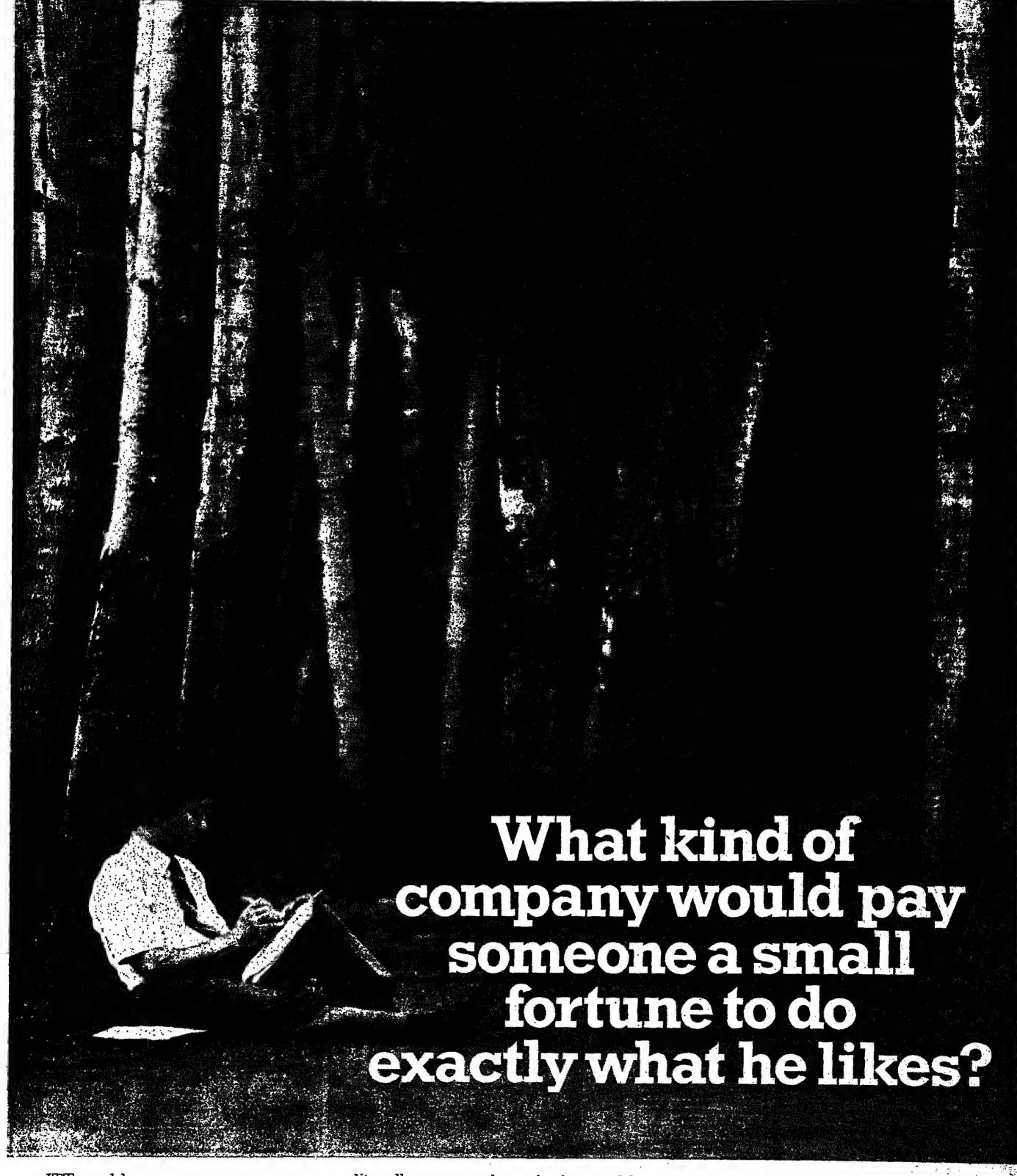
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AND CIVIL ENGINEERING

ADVISING THE PARTIES

Industry policy package

The second second

by local authorities since last autumn are described by the builders as "too little and too late" — even though they acknowledge that public works construction orders since then have been coming out at the est rate for five years.

The former government party is also told that the kndustry wants better public investment management and more construc-

Labour's proposed 50 per cent immediate rise in housing investment would "burst the balloon"; what the industry bodies ask for here is a steady commitment of increases aver-

Engineering Contractors and the National Federation of Building Trades Employers local authority direct works have submitted a seven-point package of policy requirements to Conservative, Labour and Alliance candidates contesting the general election.

Conservatives are told not to relax on capital underspending. Government estempts to solve the problem of underspending by local authorities eince last authority is outdated and submitted and solved to increase it steadily over several years. However, it is noted that the Alliance has voted against centain of the competitive tendering provisions for DLOs; it is asked not to relax competitive tendering its mobility is outdated and rules. WILLIAM COCHRANE each of the next five years.

If Labour is proposing to remove the requirements on

Support housing plea

SEVERE LOCAL housing dif-ficulties could grow into an insoluble housing problem, claims the National Federa-tion of Housing Associations in a policy statement calling on candidates in the General Election to support the growth of the housing association

movement.

Speaking at the National
Federation's annual meeting.
Mr. Richard Best, director,
pleaded for "candidates to

porting measures which would increase our pro-gramme from 30,000 to 50,000 extra homes for rent

associations now provide homes for more than one million people. They have proved their ability to help solve Britain's housing crisis through their development work and high quality services of housing reasurement.



Stores save heat cost

REDUCED ENERGY consump- heating bill. ion has become a serious pre-occupation with the engineers of ADG (Property Services), the store design and development arm of the Associated Dairies Group.

The group is now well ahead with a major building programme. Twelve Asde superstores (25,000 sq ft or over sales area) have recently been completed and five more are under construction. Asda, which under construction. Asda, which working on the new stores— of the preparation area, next to used to be known as a Northern R.E.A. Bott, W. H. O'Gorman, the refrigeration compressor stores group, now has new pre-mises from Halifax to Tilbury,

and Norwich to Gloncester.
In all these stores ADG engineers have installed a heat

The Asda system uses well-proven commercial components

supplied by the company's refrigeration and heating insula-tion contractors, who have been According to Tom Garry,

ADG's director of engineering

Sewer pipe in a gas main

A DRAMATIC first in sewerage construction is claimed by the Southern Water Authority for its installation of a 30 ins diameter sewerage pipe along the seafront at Hastings without digging a single treuch. The scheme is remarkable because two miles of high density polychylene pipe is being laid inside a disused gas main.

Sections of the plastic pipe are being welded together,

developed our expertise in both steel and timber framed. construction. Operating from our install than the previous method of indirect oil-fired roof-mounted air heaters, producing further savings of up to £40,000 per installation.

In adition, the system is considerably cheaper to buy and

and Wanson,

and Norwich to Gloncester.

In all these stores ADG services, "We believe that this engineers have installed a heat reclaim system which was development will play a major reclaim system which was development will play a major role in combating the problem veloped within the group. It of rising fuel costs in superuses waste heat extracted from the store's refrigeration system to seve more than £500,000 a combined with efficient building insulation by using this system to seve more than £500,000 a result of the section building insulation by using the section building the problem.

then fed into the old from gas main at a central point before being pulled through by a powerful winch.

As well as benefits in the town of Hastings and the local traffic, this method of construction has meant that the cost of the work has been reduced from £1.1m using conventional methods to a figure of £500,000, a saving of more than 50 per

from the refrigeration used for storing frozen and chilled foods, was partially reclaimed and used to heat the warehouse.

ADG engineers decided that there was no reason why one large condenser coil should not replace the units now installed on the roof and in the ware

This unit could be installed within a centralised air hand-ling plant providing the ventilation and heating for the store sales area and warehouse. The unit is mounted on the roof of the preparation area, next to

The air handling unit, built by Wanson to ADG designs, In-troduces ducted air at high level in the store adjacent to the checkout area, so that the staff here receive the bulk of the heated air.

A portion of the air is taken

to the warehouse at high level. Two fans, mounted in the com-pressor room, draw air from ing insulation, by using new stores."

both the warehouse and the store the units the company says it is The new system was deachieving savings of up to veloped from previous installation. This is passed through the air handling unit picking up £14,000 a year on a typical store tions in which the heat rejected heat and a percentage of fresh air before returning to the sales area and warehouse. It can be modulated from full heating to full fresh air.

The unit includes a hot water

generator, also using waste heat.
An indirect gas fired heater
has been installed as a standby

facility, but has proved to be hardly necessary.

ADG engineers hope that with the ever increasing need for refrigeration the system can be extended to provide heat for the offices as well.

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GERMAN CONSTRUCTION

Recovery too late for many

THE APPARENT recovery in Germany's construction sector has come too late for the 4,000odd building firms which have gone out of business in the current slump. It is also threatening the existence of those contractors who successfully managed to weather it.

The key to this contrary situation lies both in the depth of the building recession over the last three years and in the nature of the undiff in domestic building activity so her this year.

When the recession struck in 1980 Germany's construction industry was already operating at some 30 per cent below capacity. It was also heavily dependent on public works, and public spending was one of the first sectors to be slashed. The results were traumatic.

In 1980, 1.041 building firms went out of business, in 1981, 1,515 and in 1982, 2,020, Last rear the volume of orders for the major constractors was 25 per cent below that of 1979, employment of plant was at 55 per cent of 1979's level and labour employment in 1982 was 1.05m against nearly 1.3m in 1980. At the start of this year the total order book was an average 7 per cent down on the start of 1982, while public works orders were 17 per cent

In survive, contractors had to scramble for work, concluding current costs at a time when those costs were already rising

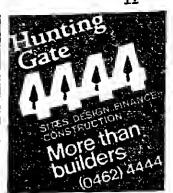
GOOD NEWS ... BAD NEWS ... BUILDING INDUSTRY ORDER BOOK CONTRACT LIFE (Vearon year percentage change in 1978 prices) (Perceptage share of 1 and 3

volume. With the rise in activity, costs in building are rising and spilling over into the other construction sectors.

But noly some 10 per cent of

which depend on public spend-

Figures compiled by the Ifo



Management Institute show that in 1979, 59 per cent of the con-tracts concluded by contractors with 500 or more employees had a term of over one year and 22 per cent a term of over two years. For contractors with 100-500 employees the shares were 37 and 7 per cent respec-

On that basis, on average of 48 per cent of the below-cost, fixed price contracts concluded in 1982 will not be completed until 1985 and nearly 50 per cent will not be completed until 1984—both years in which costs are expected to rise rapidly if the recovery continues.

will rise but that prices will stagnate or fall even further.

Although there appears to have been a dramatic increase in orders from the end of last year, these have been primarily in the housing sector, to the existent that it now makes up nearly in the total building volume. With the rise in activity, costs in building are rising and spilling over into the other construction sectors.

But nnly some 10 per cent of the total building will be total to the construction and spilling some 10 per cent of those companies which depend on public spending on construction the business. The local authorities for contracts, with 85 per cent of orders in Germany, which award two-business. The local authorities for contracts, with 85 per cent of orders having a term of over twn years. It is difficult fall in building financed by without feeling any benefit in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says Dr Gunther fall in building financed by to see" says The position is even worse

CONTRACTS

fixed price contracts at prices £15m work for Tarmac which were frequently below

those costs were already rising by an average of 5 per cent a year. While that was a valid policy for weathering the recession, it could mean bank-rupicy in a recovery.

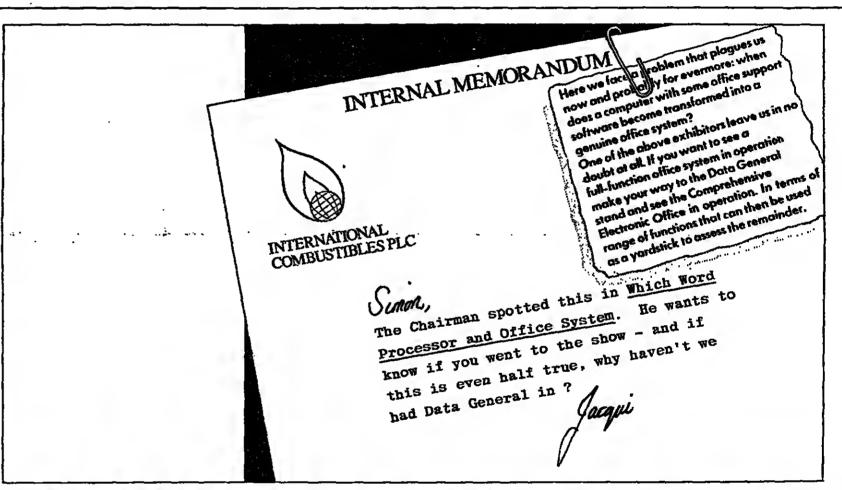
Under normal circumstances increased demand for building would tend to push up both costs and prices. But the nature of the recovery in Germany so far makes it likely that costs

Construction, has a contract warth about £1.6m for refurbishing repairing and cleaning a warehouse in Albert Dock, Liverpool, for Merseyside Development Council. Other Cubits contracts include a Trustee Savings Bank at Liverpool (£212,000); extending a transport depot for Hamilton District Council, Strathclyde (£224,000); and a warehouse at Eroxburn, Lothian, for Arthur Bell and Sons (£891,000).

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Treesbury 13 apctn 1993 8 apc

COMPANY MEETINGS—
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ir Call, 176-184, Vauxhall Bridge Road,
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ink pil Scotland, The Mpund, Edinburph,
12.15 Serricke Corp. Great Eastern Notel, Liverbook Street, E.C. 1 AS Ern Notel, Liverbook Street, E.C. 1 AS Wimbledon, 22-26, Wimbledon Hill Road. Wimbledon, 5.00 Mimbledon Hill Road. Wimbledon, 6.00 Mimbledon Hill Road. Wimbledon, 7.00 Mimbledon Hill Street, Glaspow 12.30 Mimbledon Street, Glaspow 12.30 Nichols (J. M.) IVimto, Ledson Road. Wythorshawe, Manchester, 11.00 BOARD MEETINGS—

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W. 12.00
W. Reconsell. London Charles Centre Point 19.00
W.C. 12.00
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Aluminiam Company of America 30 cts
Assoc Book Publishers 4.5p
Baker Infail Corp 23 cts
Grücen Hill Proprietary Co 21 cts
Estan Corp 20 cts
House Property Co of London 4.5p
Marrill Lynch and Co inc 40 cts
Miller (Stanley) Nides 1p
Newmarhet Company 11981) 14 cts
Southamoton, IOW and SOC RM Steam
Packet B.Sp

THURSDAY MAY 26
COMPANY MEETINGS—
ero Needes Group, Clive Works, Redtero Néedias Group, Clire Works, Red-Olteh, 3,00 Group, George Hotel Nudders-field, 12,00 Hollin Colonella, New Road, Winstord, Cheshire, 12,80 Settair Counettes, New Road, Windford, Cheshira, 12,90 Hackwood Hodge, Dorchester Hotel, Park Lane, W., 11,00 Lane, tr.
British Printing Cpa.
EC. 12.05.
Cp. 1005.
Draponara Hotel. RecomWay British. 12.30
Clayton, Son and Co (Hidgs). Queen's
North. Leeds. 2.00
Arth. Leeds. 2.00
and Gen invs. Claridges. Brook HIM. E.C., 12.00

I Investors and Trustees, 1, nee Pountney Hill, E.C., 12.00
d Jetni, Headland House, Sheldon ngham, 12.00
ank Ind Hidgs, Orient Works, Gate, Shickburn, Lancashire, 3.00
Queensway, Narris House, 76, Night, Origington, Kent, 11.00
ans (Arthur), Midland Hotel, Mane, 12.00

Street. Orpington, Kenc.
Street. Orpington, Kenc.
Henriques (Arther), Midiand Hotel, Manchester, 12.00
Jacobs (John I.), Ealtic Exchange, 14-20,
St Mary Ave, E.C. 12.00
Jerome (S.) and Sons INidgs1, Post Nouse
Hotel, Brambage, 12.39
Hotel, Brambage, 12.39
Lawrence Social Half.
Countridgeworth. Brawhope, 12.3B see (Waiter), Lawrence Social Hall, lag Mill Law, Sawbridgeworth, pressing, 12.00 Luci Invi. Merchant Taylors Hall, hreadneede Street, E.C. 12.00 lia Grayp (Mpaldings), Sutton Rockford, Essex, 12.00 Rockford, Essex, 12.00 Howard Temple Place, W.C., 11.3P 11 (Thompas), Royal Vetcorla Hotal, 11 (Thompas), Royal Vetcorla Hotal,

BOARD MEETINGS-

Interiors:
Brockhouse
Granall Whitley
M and G
RHP
Richards
Scottish Clark
Stottish Clark
Metal Inds
Stottish Clark
Metal Inds
Stottish Clark
Metal Inds
Stottish Clark
Metal Inds
Stottisholders Inv Tst
GIVIDENO & INTEREST PAYMENTS—
Beauthord Group 2.1p
Beantose Corp Sp
Bibby (J-) and Sons 5.15p
Clayton Son and Co (Hidge) 5.0681p
Clyde Patroleum 0.605p
Oravton Cornolidated Trust 2p
Etys (Wilmistedom 6.65p
Feb Intel 1.65p
Do A NV 3.65p

De a N. 1.035
Fogarty 2.42p
Minerals and Resources Corp 5.25pc Cav
Sub Bed 1937
Sub Bed 1937
Gardina Most Houses 0.805p
Southerd-on-Sea Berbush Council 12pc
Red 1987 Opc
Trurs-Cessic Tit 8.34p
Wood (Arthur) and Sos (Longport) 9.5p

FRIDAY MAY 27
COMPANY METINGS—
Babcock Intel, Business Contre, Institute
of Orectors, 116, Pail Mail, 5.W.,
12.35 of Unexams. 116, Parl Mail: 5.W.
12.30
Bentord Concrete Machinery. The Cape,
Warwick, 12.00
Black (A. and CJ. 35 Bedford Row,
Podecot 1901. St. James's Clab. St.
Book (A. and CJ. 35 Bedford Row,
Manchester, 12.30
Book (Nehre) and Sone, Banner Cross
Hall, Shefferd 12.00
Bowster Corn. CBI Conference Centre.
Centre Paire, 103. New Oxford Street.
W.C. 11.00
Breedon and Coud Nill Uma Works,
Sreedon-on-the-Hill. Leicestarable, 11.00
Charterboute Group Plaistarers Hall, 1. ... 11.00
don and Could Nill Ulma Works,
ston-an-the-Hill, Leicestenhire, 11.00
sorhouse Grods Platstreem Hall, 2,
don Wall, E.C., 12.00
Ind, Darkered Insurance Institute,
Aldermanbury, E.C., 19.30
In and Sens, Lambert Court Hotel,
Nagley Ross Edghanton, Similing,
1215 Charterhouse Grow.

Charterhouse Grow.

Loodoe Wall. E.C. 12.00

Elbar Ind. Chartered Insurance in Elbar Ind.

All. Assignment Road Edghaston, Birmingham. 12.13 and Narvey. Middland Hotel.

All. Assignment Ind. Narchesler. 12.30

Assignment Hotel. St. Katharines to buy the buildings and equipment of the Bart Ind. St. Katharines in Crownan Bank, Baith Enchange 14-20.

Nash (William). Crav Valley Paper Mills.

St. Paul's Crav. Kent. 2.30

May Se. 12.00

May Se. 12.00

May Se. 12.00

May Service S.1 and Son. Millbank Tower.

Millbank, S.W. 12.00 Millbank Tower.

Millbank, S.W. 12. or (George), Wimborne House, BarC (George), Wimborne House, BarC Bastord, Nothingham, E.O.

Orne, Nidga, Sonder Falce, Wastrort

Torking, Surrey, Falce, W. 12 60

Ed. J. S. Status Street, W. 12 60

Ed. J. S. Status Street, W. 12 60

Ed. J. S. Street, W. 12 60

Ed. J. S. Status Street, W. 12 60

Ed. J. S. Old Broad Street, E.C.

West, 117, Old Broad Street, E.C.

CARO MEETINGS-

AIT CALL 3.75p PINIEREST PAYMENTS— After the Tate 3.6p Bank of Mpotreel 14tpc Dep Nts 27/5/87 Tiec DIVIDEND & INTEREST PAYMENTS-Bank of Mooreel 14-ce con 14-2 at 14-2 Barratt Developments 4-2p Book Phone Lanceela Machinery 2-60Sp Book Phone 16-0 3-55p Branell CC 0.7 3-55p Branell CC

Home Charm 2.19
IMI 2P (John I.1 1.5p
Jacobs (John I.1 1.5p
Jeromo (S.) and Sons (Hidgs) 1.595p
Jersey Electricity Gr A 11p
June Inv Tst 2.30p
Kent M. F.1 G.35e
Majnoila G-pup (Mouldings) 1.7a
Maribo ough Property Nides 0.45o
Maribo ough Property Nides 0.45o Magnoila G-bup (Mouldings) 1.7a
Maribo ouch Property Nides 0.45o
Molins 5.To
Morrison (Wm.) Supermarkets 1.15p
New Tokyo Inv Tst 0.025p
Psychey Property Corp 2.25p
Roto. k 2.15o
Sharpe and Fisher 1.45p
Simp Oathy Berhad 45cp
Subbeam Wolsey 3p
Do. Bec Pref 3.012p
Torner and Newall 111apc Mbg
1995-2000 5 8T5p
United Ceramic Ostaributors 2.5p

Vair Group 1.75p SATURDAY MAY 28 OIVIDENO & INTEREST PAYMENTS-Indene Ims Sypcia 1980-88 4-pc eric house Group 3-22p

Wolsingham Steel managers in rescue bid

BY NICK GARNETT, NORTHERN CORRESPONDENT

THE MANAGEMENT at Wol- traditionally gone to British singham Steel, Durham, the Shipbuilders. British Shiphuilders subsidiary steel wor's which the state corporation is closing, is trying to buy the buildings and equip-

The site produces steel from scrap, produces stand frames

seeking a form of financial commitment from someone else before committing funds. The management has already

formed a company, Weardale Steel (Wolsingham), which is taking orders for new work. It cannot carry out the work unless the Wolsingham assets are purchased. Mr Mason made clear yesterday that the present

company would have to close before that could be done. Wolsingham Steel made a loss of about £900,000 in the past financial year, though some of this is attributed to British Shipbuilders beving halted in-

Financial Times Monday May 23 1983 BUSINESSMAN'S DIARY June 5-19
Chemical and Processing Engineering Show—EUROCHEM (01-747-31311 NEC Birmingham June 12-16
Shopes International (01-540 Clympia

Jnne 28-30

June 28-July 1

July 47

June 19-22

NEC Birmingham

ROSPA International Safety Ex-hibition (Birmington (0211 TSO 4141) NEC Birmington

National Agricultural Centre.

UK TRADE FAIRS AND EXHIBITIONS

Chelsea Flower Show (01-834 433331 Royal Hospital May 24-26 International Cooference and Ex-International Coorderine and Exhibition on Computers and Communications in Investment Banking and Insurance (Northwood Hills (09274) 28211)

Barbican

June 28-30
Printing, Packing and Allied
Trades Exhibition (Norwich
(0603) 715588) East Angila
Exhibition Centre
June 28-July I
Security Tradex '83 (Redhull
(0737) 68611)
NEC Birmingham International Word and Informa-tion Processing Exhibition and Conference (01-405 6333) Wembley Conference Centre

June 1
Advertising Business Systems 555100) Show (01-637 7438)
Press Centre, EC4

June 5-7
Offshore Computers Conference
and Exhibition (01-734 4343)
Micro Trade Exhibition (01-486
Rarbican Aberdeen 1951)

OVERSEAS TRADE FAIRS AND EXHIBITIONS

Current Algiers International Trade Fair (01-221 7800) (until June 1) Algiers

May 27-June 5
Paris Air Show (720.61.09)
Paris Faction Show (0483 38085)
Washington

International Telecommunica-tions Congress and Trade Fair —IFCOM (01-930 7251)

AND MANAGEMENT

BUSINESS

House: Chatham Australia, chances of economic recovery (01-930 2233) St James's Square, SW1

lodustrial Society: Quality circles
—keeping the enthusiasm going
(01-839-4300) May 24-25

Tostitution of Civil Engineers.

7th World Airports Conference
(01-222 7722) Cafe Royal, WI
Frost and Sullivan: Systems network architecture (01-486 0334)
War 25
Cumberland Hotel, London

May 26-27
Afionovac: Venture Capital in the European/French context (Paris (1) 622 2445)
Fontainebles

June 27-July 1
Manufacturing and Plant Maintenance Exhibition — PEMEX (01-486 1951)
Johannesburg

Under Water Technology '83 (01-250 3561) Amsterdam

International Saw Machinery and Forestry hibition—ELMIA (0732

Latin American Petroleum Show (01-546 5144) Venezuela

Institute of Directors: City branch annual conference (01-606 7700) Press Centre, EC4 June 6-7 The Economist: Western arms co-operation—how to make joint procurement work Portman Square, W1

Management Ceotre Europe: International (219.03.90) Rrussels Accepting the enthusiasm going Manchester Business School: Strategies: to reduce unemployment (061-273 8228)

May 24-25
British Franchise Association:
Expansioo through franchising (Colnbrook (964) 4909)
Holiday Inn, Swiss Cottage
May 24-26
May 24-26
May 24-26
Manchester

June 9-10
Computer Assisted Televideo:
Interactive videodisc seminars (01-583 1932)
Kensington
Close Hotel, London

rwp: Teletext and the way of cessor user (01-242 8897)

Wembley Conference Centre CBI: The A to Z of employment law (01-379 7400)

Centre Point, WC1 June 16

IPS: The world truck (0780 56777) Tara Hotel, W8 June 1
Brighton Polytechnic: Interactive video and computer training (Eastbourne (0323) 21400)
Eastbourne (323) 21400 (4377) Hollday Inn, Birmingham

June 1-2
FT Conference: Vehicle components (01-621 1355)
Geneva (01-839 1233)
Fail Mail, SW1 Anyone wishing to oftend ony of the obove events is advised to telephone the organisers to ensure that there has been no change in the details published

Financial Times Conferences

WORLD ELECTRONICS: EUROPE-THE WAY AHEAD

London-June 21 and 22, 1983

This 1983 meeting, the sixth in the Financial Times' World Electronics series, will focus on the industry in Europe and European markets. One of the forums will analyse opportunities in growth areas featuring papers by Mr R. D. Leister, Consultant to the Chairman of the Board, AEG-Telefunken; Mr Pasquale Pistorio, President, SGS-ATES; Dr Jurgen Muller, Deutsches Institut für Wirtschaftsforschung; and Mr Desmond Pitcher, Managing Director, Plessey Telecommunications and Office Systems Limited.

THE PROSPECTS FOR OIL PRICES

London-July 6 and 7, 1983

The prospects for OPEC, its structure and role in the oil market will be the principal theme of the Outlook for Oil Prices Conference to be held in London on July 6 and 7, 1983. Sheikh Ali Khalifa al-Sabah, the Kuwaiti Oil Minister, will be the keynote speaker at this major international forum.

Please address all enquiries to:-

The Financial Times Conference Organisation Minster House, Arthur Street London EC4R 9AX

Tel: 01-621 1355 Telex: 27347 FTCONF G Cables: FINCONF LONDON

2.36 Westin. Green Lane Works Lakester. 3.00 and rudders, and makes the steel castings and steel-plate 230. Schoolste. E.C. 12.00 proposes. Only a third of its output has Ranta Hovis McDou-itotust Nati Tst Stakis MEMORY FEED-BACK. The capacity to solve all you international business telecommunications problems, right down to the equipment you need. ELECTRONIC EYE. **VOICE FREQUENCY** Watches over every aspect RECEIVER: DI VOUI COM As soon as you start talking international telecommunabout your company's ications system, once we've telecommunications needs, set it up. it picks up every last word. DETECTOR. Sensitive to any burning problem you may have with your system before it ever gets out of hand. (WITH BUILT-IN DE-SCRAMBLER). Will communicate answers to your problems in simple. non-järgon terms.

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To many companies, the whole subject of their international telecommunications is a nightmare.

There's the question of who you should turn to for specific advice and detailed recommendations.

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Then comes the question of who will make sure your new system operates

smoothly, day by day. And who is sufficiently in the know to keep you up with new developments.

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And keep your fingers crossed. With the introduction of our new service. however, you only need talk to one. And you won't need your fingers crossed.

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Call us and we'll assess your telecommunication needs in terms of your current systems and procedures. We'll look at how efficiently they work. What it's all costing. And what should be done for the future.

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guaranteed level of efficiency. Until now, no single body, however distinguished, has ever been able to offer such

a comprehensive service. And the reason BCS can do it is because it offers the resources of two such bodies.

On the one hand, British Telecom International.

On the other, PACTEL, one of the world's leading computer and telecommunications

consultancies.

You can find out what these combined resources can mean for your business by phoning Jim Pickard or Peter Rooms on 01-583 5458. Or come and see us on stands 51B and 71B at the Business Telecom Conference and Exhibition at the Barbican

Centre, May 24th to May 26th. And we'll introduce you to one answering machine that'll never be at a loss for an answer



Financial Times Monday May 23 1983

Meet the Nova. Vauxhall's new little car. A car designed to do a lot, a little better.

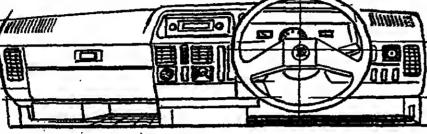
Its imaginative design has achieved a greater sense of space in a quieter interior And a new generation of engines offer more power, more punch and more economy. L

BETTER TO DRI

Even in third gear, the Nova will zip from 15 mph to 65 mph and back again without the slightest hesitation from the engine. An achievement made possible by the design concept of Low End Torque (LET). With fewer gear changes, the Nova's easier and punchier to drive.

BETTER SPACE.

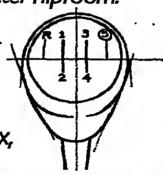
Within modest inches, the Nova is deceptively large. Its wide doors open wider than its major competitors. Likewise, it offers the



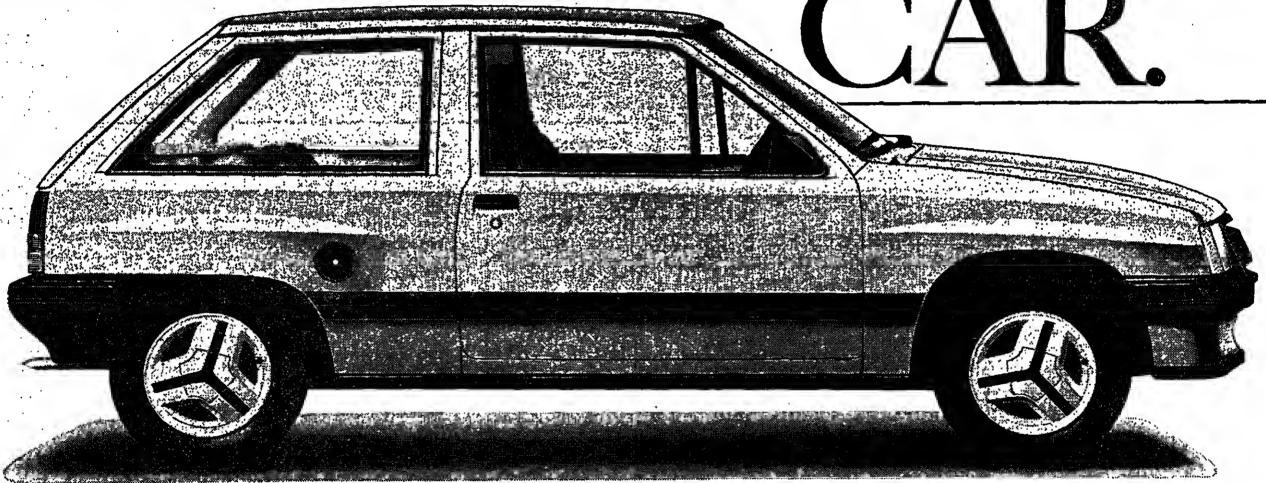
driver better headroom, better legroom and better hiproom.

BETTER ECONOMY

With the aid of better aerodynamics, the Nova's 1.0 and 1.2 litre LET engines deliver 57.6 mpg at 56mph. And 60.1 mpg with the 5-speed gearbox, available as an extra cost option.



THE NEW VAUXHALL NOVA.



BETTER EQUIPMENT. In striking contrast to other small cars, the Nova features a fully integrated dashboard. Every model has power brakes, a laminated windscreen

and halogen headlamps. There's an intermittent rear wash wipe on hatchbacks. And on L models, there's a push button radio and a drivers door mirror that adjusts from inside the car. All touches of luxury traditionally found only on more expensive cars. TER. BY DESIGN.

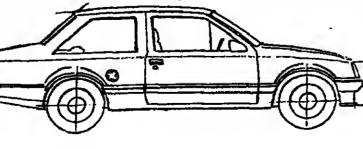


BETTER CHOICE. The Nova is not one car

but two. The saloon offers an enormous boot of 15.2 cu.ft. which is even bigger than you'll find on a lot of much larger family saloons.

YICS:

F(R)



FROM £3,496. Until now a modest price meant a basic car. Nova marks the turning point. We offer all of its refinement in 4 models, from just £3,496 to £4,273. The Nova is waiting for you to test drive at your friendly Vauxhall-Opel dealer.

ILLUSTRATED: NOVA L HATCHBACK £4273. DASHBOARD FROM NOVA L. ALLOY WHEELS SHOWN ARE AN EXTRA COST OPTION, ALL PRICES, CORRECT AT TIME OF GOING TO PRESS, INCLUDE CAR TAX AND VAI. DELIVERY AND NUMBER PLATES EXTRA. DOT FUEL CONSUMPTION FIGURES MPG (£/100KM). NOVA LO; CONSTANT 56 MPH: 57.6(4.9); CONSTANT 56 MPH: 57.6(4.9); CONSTANT 75 MPH: 44.8(6.3); URBAN CYCLE: 33.2(8.5).
75 MPH 42.8(6.6); URBAN CYCLE: 37.7(7.5), NOVA L2 5 SPEED: CONSTANT 56 MPH: 60.1(4.7); CONSTANT 75 MPH: 44.8(6.3); URBAN CYCLE: 33.2(8.5).

MASS TRANSIT SYSTEM AT A FRACTION OF PRESENT COSTS

Flyda seeks slice of the cake

BY ELAINE WILLIAMS

FRANCIS PERROTT is an ex-naval officer and engineer who decided that he could design urban mass transit systems for the fraction of a cost of traditional transport. So he set up a company called

Flyda to put his theories into practice. Partly funded by himself and Electra Risk Capital, the company bopes to eventually take a large slice of the mass transit market which is currently worth around U.S.\$7bn a year.

The Flyda system consists of lightweight, quiet, rubber-tyred vehicles powered by electric motors capable of carrying 12 passengers each. These are cantilevered from overhead grideways Narrow elevated guideways. Narrow elevated steel or concrete bridge structures will support the elevated tracks which are only 1.5 metres to 2 metres wide.

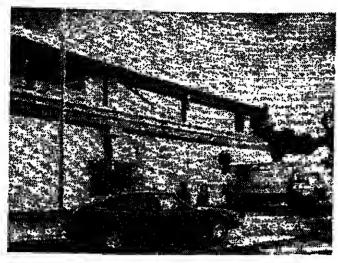
Elevated

The light bridging span of the elevated track has slim 70 cm company says that other transit systems need large constructions up to 8 metres wide for their elevated runways.

Trains can be cantilevered from either side of the guideway. A simple roof mounted "switch wheel" allows trains to select tracks on elevated guideways or on the ground so that no moving parts are needed on the track itself.

Such a system, says Mr John Emanuel, Flyda's marketing director, would cost around 40 per cent of a comparable elevated system and a mere 10 per cent of the cost to build an underground railway system. Depending on the capacity and situation of the mass transit system the cost for a Flyda network would average out between U.S.\$3m and U.S.\$12m per km of track. Even so, Mr Emanuel says that the system would be capable of handling the traffic capacity of the London underground, for

Typical costs for a conventional elevated system costs between U.S.\$25m to U.S.\$60m per km while underground con-struction costs U.S.\$50m to U.S.\$120m per km, says Mr Emannel. A basic ground transportation is the cheapest of all costing between U.S.\$1m



Above. The Flydaway Pre-cast Concrete Track with Flyda light rail (left) and a "Flydaway."



outdoor track of about 600

at least two microprocessors which will control the vehicle

CONVENTIONAL LIGHT RAN

and U.S.\$5m. Inow being constructed in Kid-Flyda has estimated that its derminster by crane-makers system could run economically Fellows Stringer. By next year with a train interval of about this will be extended to an

one minute. With trains made outdoor up of vehicles carrying between 12 and 20 passengers, it is possible to adjust train lengths according to time of day. Since projects In advance of the prototype, Flyda has tenders for two UK projects with GKN Contractors. It also hopes to seek similar co-operative arrangements with they are computer controlled, it will be possible to operate an off-peak passenger demand seroverseas contractors for future major urban transit systems. A prototype system is now being constructed which should

A prototype system is now being constructed which should be ready for demonstration in September. The first passenger passenger vehicles will contain relief to being built by Justin. September. The first passenger vehicle is being built by Inter-national Automotive Developments, IAD, specialists in proto-type vehicle building, based at with the central routing com-Worthing. This will be tested puter based at a main station. on a 250 metre indoor track. Mr Emanuel said that the

company hopes that a car manufacturer would take over the manufacture of the passenger vehicles once mass production orders had been received. Reliant has already shown interest in being involved with the Flyds in this respect. The company is very confident that it has a place in the mass

ransport business. Several transport authorities in North America, Europe and Asia have expressed interest in Flyda's concept and are now awaiting the operation of the prototype system before any firm commitments are made

The company has also started bidding for cootracts in the UK. It hopes to bid for the London Docklands light rail transit system in partnership with a major civil engineering com-pany. Flyda reckons that it could cut as much as 530m off the budgeted cost of £65m to build it.

At present Flyda has to prove that it can provide an efficient safe and low-cast mass transit effect of the environment as effect of the environment as Mr Perrott claims. If the com-pany does get off the ground, in every sense of the word, it could create opportunities for up to 20,000 jobs in the UK with an output of about 20,000

Banking

Transfer service

BANKERS' AUTOMATED Clearing Services (BACS) the UK banks electronic funds transfer service will now transfer debit or credit instructions over the telephone, thus saving the transport costs of moving magnetic tapes or discs to the BACS

computer centres. Companies will be able to transmit instruction either at prearranged times or at will

The new system, BACSTEL, will cost no more than any other form of electronic funds transfer and reporting back to confirm instructions is instantaneous, Mr Derek Balm-forth of BACS Marketing AMBITIOUS SOFTWARE SUPPORT COMPANY

£400,000 venture capital for Sphinx

AN AMBITIOUS new software support company—headed by former Zilog European marketing manager, Pamela Geisler, has just been launched with £400,000 of venture capital back-

The aim of Sphinx—as the new business is called—will be to market and support software based on the Unix operating system and, once this is established, move into promoting "turkey" systems turnkey" systems.

Money for what is a substanmuney for waar is a substan-tial start up by any standards is being put up by two venture capital specialists—the APA Venture Capital Fund and Abingworth, a company which is planning an Unlisted Securi-ties Market listing.

Tempted

Each is contributing £200,000, out in line with what APA claims is now common practice in the U.S. the share of the equity which they have bought is not at this stage being dis-closed. The management team, which includes another ex-Zilog executive, holds a controlling interest.

Geisler has been tempted into setting up on her own by the high degree of interest in Unix, a microcomputer language the appeal of which lies in its multi-user facilities, its porta-bility across machines from different manufacturers the wealth of system development aids.

IBM and the Digital Equipment Company (DEC) (Unix was developer in Bell Labs on its PDP 11mini computer), have both recently announced that it will be available shortly on their machines. on their machines. While many academics beg

to differ, there is a widespread feeling, shared by the founders of Sphinx, that Unix will inevitably become the standard operating system for 16 and 32

of manufacturers," says Dr Doug Eyeions, director general of the Computing Services Association. "When IBM and DEC move the world is likely "There is certainly a shortage of companies concentrating just on Unix software. I would

say that Sphinx is on a good wicket." Initially, the new company will distribute tools and applications software to run on publish, package, actively market and support software sourced in the UK and the

Besides expressing confidence in the future of Unix, Geisler directly commission products feels Sphinx represents the first for which we feel there is

NEC. For entry details contact Eureka on 0322 77755.

bottles and containers

had its first export orders

from India and Pakistan for a recently introduced machine

that can handle a wide range of items at high speed. Designated 455/GB/3, the

machine can handle diameters

between 35 and 100 mm and

heights from 100 to 300 mm.
The throughput varies from
20 to 80 bottles per miaute.
Employing three screen
printing heads that can deal

with body and shoulder of the

bottle in one pass, the machine is completely inte-grated mechanically and is driven by one variable speed

After installation, ne timing adjustments are needed, whatever speed or bottle size

THE NEW LINIPLEX FL HF RECEIVER

A new radio technology for better reception of the BBC around the world.

Printing

customers will be OEMs, dis-tributors, large end users and of the hardware market, her other software houses.

Leading manufacturers or contacts in the industry and her appreciation of end users software requirements. But in turn APA's Peter Englander has agents of Unix-based microco uters include Plexus. Wicat. contributed more than just money — having sounded out industry experts on the likely markets for the new service and helped build the management Altos. Tandy and Fortune and Bleasdale. Sphinx has contacts,

puters, Thame Systems and Encotel Systems which are the leading distributors of Unix machines and systems in the Unix machines. Sphinx will not "The first aim will be to develop software, rather it will gather up the best software products and sell them; then we will find ones which need

a certain amount of co-operative effort and offer a marketing service; and finally, we will "Unix operating systems are centralised supply resource for strong potential," says Geisler, being adapted by the majority the system in the UK. Target APA has clearly been im-APA has clearly been im-

team in advance of the launch.

The APA Venture Capital
Fund which has now committed
more than £3m of its £10m total
resources had already invested
in computers but also takes
equity stakes in non-technology Investments include Encotel

Systems, Systematics (the microcomputer software company) and My Kinda Town, the company which owns the Chicago Pizza Ple Factory.

CONTRACTS AND TENDERS

AMENDED NOTICE

GUYANA SUGAR CORPORATION LIMITED

field and factory equipment **AGRICULTURAL SECTOR LOAN GUYANA SUGAR CORPORATION LIMITED**

Tenders are hereby invited from suppliers for provision of field and factory equipment to be acquired under the Referenced Loon. The inter-American Development Bank is partially funding a rehabilitation programmennder Loan Contract 660/5F-GY through its fund for special operations. Eliability with respect to origin of goods and services will be determined purposals to the roles applicable for the ase of the fund.

Tenders will be invited for the following ecoloment which are divided into Lots indicated in the contract documents:

LOT A FIELD EQUIPMENT'
A ! — Thirty-serien (57) Tractors up to 100 ha
A 2 — Fourteen (14) Tractors above 100 ha

LOT B PACTORY EQUIPMENT
B 1 — Electric motors
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B 5 — Complete mud filters
B 5 — Machine tools
B 7 — Indicator and control systems

specifications contained in the tender document permit offers of alternate equioment which have similar concateristics and provide equal performance and qualify to those stated.

ders documents can be obtained at the office of: Gothria Booker Merchants International Limited Auditory House 18-20 Ely Place

Landon ECIN 88N Guyana Sugar Corporation Limited 22 Church Street

Georgetown requests and against a non-reimbursible payment of Gayana dollars 150 equivalent in foreion exchange by crossed cheque in favour of the years Sogar Corporation. styring segar Corporative.

Amendments to the original tender documents will be circularised.
Indexes who have niready submitted a bid in response to the original
all for tenders should confirm their original tid or submit new bid. This
gos bid will supersede the original bid.

will superseet the original bid.

no way identifier the tear erer to the following address:
The Chairman
Central Tender Scart Committee
Guysuco Rehabilitation Programme
Agricoltare Sector Loso
(10 Ministry or Finance
Main and Urqahart Street
Georgetown

Republic of Guyana Footh America nders close at 14.00 Zours (Z. p.m.) Guyana time on Windnesday 3 1962. Tenderors or representatives may be present at the

INTERNATIONAL TENDER FOR THE PURCHASE OF SHOP EQUIPMENT AND **MACHINE TOOLS**

INVITATION No. T-06/75

The Provisional Military Government of Socialist Ethiopia, Ethiopian Transport Construction Authority, announces the release of an international tender for the purchase of Shop Equipment and Machine Tools.

A loan is available from the African Development Fund (A.D.F.) and interested bidders from member countries and participating states of the A.D.F. are requested to collect bid documents during office hours from the Procurement Office Room 106, of the Ethiopian Transport Construction Authority against payment of Birr 20.00 for each set of documents.

Bids will be opened in public in the Conference Room, 4th floor, of the Ethiopian Transport Construction Authority headquarters building on July 16, 1983, at 10.00 hours Addis

The Authority reserves the right to reject any or all bids that are not in conformity with all conditions and specifications mentioned in the tender. ETHIOPIAN TRANSPORT CONSTRUCTION AUTHORITY

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(National Company for the Exploitation of Oil Wells) ADVICE OF EXTENSION OF TENDER The Entreprise Nationale des Travaux aux Pults: 2, Rue du

Capitaine AZZOUG - Côte Rouge - Hussein Dey - ALGER ALGERIE (ALGERIA), wishes to inform interested companies that international Tender number 914.AE/MF for the supply of: 01-GD Air Winch (Well Winch) type HMKL 61281 02—Electric Winch with electrically operated brake, make STONL type OC 2040 with Electric Motor

03-Injection head NAT. N. 815 04-12/18 Desanding Devices "on Skid"

05---12/16 Desanding Devices "on Skid" the original closing date of which was 7 May 1983, has been extended to 18 June 1983.

COMPANY NOTICE

GADEK (Malaysia) BERHAD Notice of Meeting

NOTICE IS HEREBY GIVEN that the Fifth Annual General Meeting of the company will be held at Ladang Pinji, Lahat, Perak, Malaysia, on Saturday, 11th June, 1983, at 12.00 noon for the following

To receive and adopt the accounts for the year ended 31st December, 1982, and the directors' and auditors' reports

To sanction the payment of directors' fees.

To re-elect directors.

To appoint auditors and to authorise the directors to fix

4. To appoint their remuneration.
5. To transact any other ordinary business.

By Order of the Board OH KIM SUAL

Ladang Pinji Lahat, Perak

NOTES

(1) A member of the company entitled to attend and vote at the meeting is entitled to appoint a proxy to vote in his stead. A proxy need not be a member of the company but unless he is, then by the provisions of Section 149(1)(b) of the Companies Act 1965, he must be a qualified legal practitioner, an approved an approved by the Registrate of company auditor or a person approved by the Registrar of

Companies.

The instrument appointing a proxy must be deposited at the registered office of the company not less than 48 hours before the time sot for the meeting.

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engineering Competition journal. The awards will be presented at a dinner in Birmingham on October 4, the opening day of the Design Engineering Show at the

Engineers' design contest **Bottle**

THREE of Britain's top specialists engineering people are to judge a nationwide engineerng design competition — the Archimedes Awards - for which entries are now being

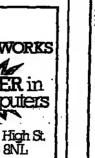
sought.
They are Sir Monty Finniston, former chairman of British Steel and author of the Finniston Report on the engineering profession: Clive Sinclair, chairman of Sinclair Research and the man behind the world's fastest selling line of home computers; and E. A. L. Hyde, the recently retired Director of Research British Aerospace Corporation, and now a consultant.

Exploits

British manufacturing com-panies are invited to submit entries in three categories chosen to reflect current challenges in engineering design. These are: the best technical These are: the best technical innovation in a new or redesigned product; the most innovative advance in product design made possible by incorporating electronic control; and the finest example of a product which exploits a new manufacturing technique or process.

nique or process.
The judges will select three finalists in each category with the eventual winners being chosen by a postal ballot among the readers of Eureka,







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is selected, and the machine is able to operate on a three shift basis. More on 01-741

Cameras **Graphics**

trolled camera for use in the print and graphics industry has been launched by Halco Sunbury, the UK based company. The company has been working closely with an electronics company, Ash Elec-tronics, to develop the new camera which is designated SCREENLINE, a relatively new London company that specialises in printing on the Copilyn SAS4.

Halco is hepeful to break the foreign domination of this market by its low cost but

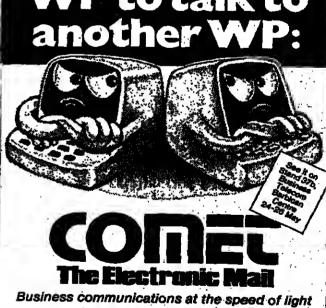
sophisticated product. It represents the largest invest-ment ever made by the company. More details of the product on 9784 61332.

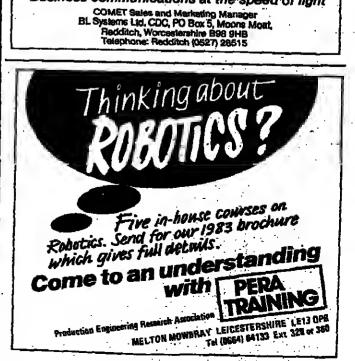
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line costs.

A STATISTICAL multiplexer for use with the VAX and have been launched by the Digital Equipment Corporation. It allows up to eight asynchronous terminals to be connected to the computers. DEC says that the multiplexer is compatible with its existing DZ11 8-line interface and dramatically cuts modem and

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Mr Peter Englander, APA, Dr Pamela Geisler of Sphinx and Mr Ronald Cohen, Managing Director of APA, signing the documents for the launch of Sphinx.

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THE MANAGEMENT PAGE

Kevin Done on the outcome of Saab-Scania's shift in strategy

Specialisation powers a recovery

of the balance sheet, but five years ago we bad to be," admits Alv Elshuit, executive vice president and finance director of Saab-Scania.

For many long years, Sweden's seventh largest indus-trial corporation has been clawing its way back to financial respectability. "We did not talk of a critical situation," says Elshult, " but in my opinion we were very close.'

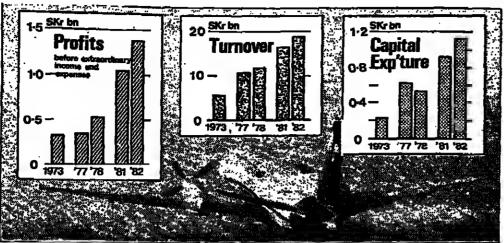
After years in the doldrums, Saab-Scania, a cornerstone of the powerful federation of Swedish financial and industrial corporations dominated by the legendary Marcus Wallenberg, is finally reaping the benefits of a far-reaching shift in corporate strategy and an ambi-tious investment programme, which dangerously stretched its finances during the late

In stark contrast to the diversification spree undertaken by Volvo, Sweden'a biggest industrial group and Saah's only domestic automobile com-petitor. Saab-Scania has chosen very consciously to concentrate very consciously to concentrate its activities in a small number of markets and within these areas to specialise in small, clearly defined segments but on an international basis. "The sooner you come to the conclusion you cannot do everything, the better," says Elshuit.

Such thinking lay behind the decision to abandon the com-puter sector. "We invested an wful lot of money and lost a lot of money in computers," admits the finance director. "I never thought we could fight with the glants, we did not have the resources." Sperry Corporation of the U.S. acquired Saab-Scania's shareholding in Saab-Univac in 1980 and at the end of that year the group sold its shares in Datasaab to L. M.

Resources have been concentrated in specialised segments of the transportation market (heavy trucks and buses, high performance cars and short-haul civil aircraft), priority status has been given to the expansion of international marketing, and the company has sought out substantial foreign partners to share the growing burden of research and development costs. The move into the executive of international marketing, and

and luxury car market is finally paying off with the emergence of a model, the Saab Turbo, that can challenge the acknow-



b-Scania has shown substantial progress in the past three ye turbo-prop civil airline (above) is seen by the company as

At the same time a far-reaching this size exists between 1985 technical co-operation is under and the end of the 1990s. way with Fiat/Lancia of Italy Remarkably, it is the first airtechnical co-operation is under way with Fiat/Lancia of Italy to support the development of Saab car modal for the late 1980s.

Co-operation with Fairchild Industries of the U.S. will see the launch of a new short-haul aircraft next year, Saab's first civil aerospace venture since

Sten Gustalson, recently promoted from managing director to chairman of Saab-Scania—a position hald until 1980 by Marcus Wallenberg — accepts that as recently as two to three years ago the company "was fraught with uncertainty." Some of the darkest clouds were hovering over the group'a aerospace activities, which were dangerously dependent on one customer, the Swedish state, and one product, the Viggen fighter aircraft, due to be phased out by the late 1980s.

Saab decided that the salvation of aircraft activities lay in breaking into the fiercely competitive civil aircraft market, a risky move but an area where it could exploit high technology know-how already gained from its military aviation pro-grammes — which it had certainly failed to do previously. Together with Fairchild, it opted at the beginning of 1980 to develop a twin-turbopro, 34-passenger regional airliner and executive aircraft, the Saab-

The 50/50 joint venture has a the last two years, Iraq — the biggest break-even point of around 200 larger even than the home shareholders planes. About 100 orders have been taken to date and Saab is sales of 3,900 units in 1981 to corporation.

uner ever developed by partners on opposite sides of the Atlantic.

With a record development time, Saab and Fairchild maintain they have stolen a march of at least 6-12 months on the main competitors, De Havilland of Canada, Embraer of Brazil and a state-owned Franco-Italian consortium. First delivery is scheduled for April next year and the new plane shows the earnest of Saab's shows the earnest or Saro's attempt to wean itself away from the military sector and the whims of Government purchasing policy.

That said, however, prospects

for military aircraft production have now brightened with the ahead for the state the development of a new multi-role combat aircraft, the JAS 39 Griben (Griffin). Saab-Scania's survival during

the dark years up to 1980 for most of the 1970s the car division was losing money was only mada possible by the strength of the Scania truck operations, which have regu-larly generated more than 80 per cent of group profits.

Setbacks on the truck side have not been sufficient to deter the company from seizing the opportunity off and by the general recovery in the group's fortunes—profits (before extraordinary income and expenses) rose by 32 per cent last year to SKr 1.38bn (5184m) on a 16 per cent increase in turnover to SKr 18.7bn—to launch a For the moment, tha Scania trucks operation appears to have retreated into its shell, however, under the shock of the worst crisis the world's heavy truck industry has suffered in the post-war period. SKr 566m rights issue, one of

Tha biggest single market of the last two years, Iraq — the biggest calls on domestic larger even than the home shareholders for new funds market — bas collapsed from ever made by a Swedish ledged West German masters in betting that a world market for barely a few hundred this year. Of total turnover last year of this sector at their own game. 1,500-2,000 regional aircraft of Scania has at least been able SKr 18.7bn, trucks and buses

To prevent new product development being dwarfed by the major divisions, Saab bas reorganised these areas into separate companies in recent months with the establishment

wagen/Audi.

to better its share of the sink

ing markets in West Europe and South America, however, and its truck profits have not

declined as sharply as the fall in production volume.

slumped to 20,900 last year compared with 27,700 in 1980

and 25,200 in 1981. Concentrat-ing on trucks of 16 tonnes and

ing on trucks of 16 tonnes and above, Scanla accounts for 15 per cent of the total world export market for heavy trucks, ranking behind only Daimler-Benz and Volvo and ahead of rivals such as Iveco and MAN. Excluding the eastern bloc, Scania took around 5 per cent of world production in this class last year.

Its commercial vehicle manufacturing operations in Brazil and Argentina—it beld 46.1 per cent of the Brazilian heavy

truck market and 528 per cent in Argentina last year—have suffered serious setbacks given

the turmoil in the local eco-

nomics, but Scania is still seek-ing to expand assembly opera-

tions in developing countries.

Setbacks on the truck side

increase in turnover SKr 18.7bn—to launch

Truck and bus output

of independent profit centres. Saab-Scania Combitech, created in January, is the umbrella for independent operating units covering areas such as missiles—both the Swedish and Finnish axvies are buying e new Saab anti-ship missile and the airborne version will be used in the group's new JAS 39 fighter aircraft—satellite systems, elec-tronics, precision mechanics and

Another subsidiary created

cent), cars for SKr 5.8bn (31 per cent), cars for SKr 5.8bn (31 per cent) and aerospace SKr 1.7bn (9 per cent). The group also enjoys a profitable sideline as the Swedish importer for Volks-

Another subsidiary created a little over a year ago, the ASJ group, brings together products for industrial process monitoring and control as well as hearing and energy recovery. A measure of the hole that Saab dug for itself was the massive increase in its dependence on borrowed funds during the mid-1970s. In four years to the end of 1978 longterm debt more than trebled to SKr 2.6bn from only SKr 800m skr 2.60n from only Skr 800m in 1973. In the same period, its debt/equity ratio slumped from 45.3 per cent in 1973 to 29.8 per cent in 1977. "At under 30 per cent, you don't have much room for manoeuvre," admits Elsbult.

Three highly profitable years in booming international truck in booming international truck markets in 1978, 1979 and 1980 helped to stop the rot, however.

"Wa were lucky that the earlier investments were good and that profits increased in time," says Elshult. The result is that equity funds have been pushed back up to 42 per cent of the halance sheet and investments over the last five years ments over the last five years from the group's own resources. Capital investment from 1978 to 1982 totalled SKr 3.75bn which 89 per cent was spent in Sweden last year—and was topped by research and deve-lopment spending of SKr 4.3bn. After a big improvement in 1979, profitability slipped back

slightly in the following two years before surging ahead again last year. Boosted by the best performance of the car division since production began at the end of the 1940s, Saab is already predicting higher profits for 1983

"WE ARE the world cham "WE ARE the worm champions in low-cost development," says one executive of
Saab's car division. On the
face of it, the group has performed a miraculous sleight
of hand. It decided in 1979 to
abandon the building of small passenger cars—the first two-stroke Saab of the 1950s was 2 sort of Nordic 218303 was 2 sort of Nordic 218305 to the Volkswagen "Beetle" and its direct descendants survived until 1989—in order to concentrate solely on the upper-middle segment of the market with more exclusive models capable of competing on export markets.

This is the segment where Saab hopes it can make money despite small produc-tion volumes.

The model chosen to spear head the campaign, the Saab 900, first presented in 1978, is itself only a development of the Saab 99 which was introduced as long ago as 1968. It was not the most obvious launching pad. The transformation

Saab's image from the producer of small family cars

of rather eccentric appearance to the maker of high performance saloons for the sporiy executive and well-heeled professional centres around one word—"Turbo."

Even here the heat tech. Even here the basic tech-nology was not new—Scania, which supplies the engines and transmissions for the Saab car division, has been producing turbo-charged diesel engines for trucks for decades. But Saab-Scania was the first on the world market in 1977 to introduce a successful inroo-charged petrol engine for the car designed for normal motoring

and not for the race-track. Saab is now developing its third generation of turbo-charged passenger car engine. the number of initiators around the world that have been forced to incorporate turbo principles in their own engine design and product

The demand for Saab's Turbo cars has helped boost car production from 65,800 in 1980 to 83,500 in 1982. By the end of last year, Saab was producing at a rate of 90,000 cars a year and output will have been increased to 100,000 by the end of 1983. The impact on profitability has been dramatic. After years below the break-even point in the 1970s, the booming profits of the ears division are more than making up for the decline in earnings from the trucks division.

Volume sales to the U.S. jumped by 24.1 per cent last year and rose by another 52 per cent in the first quarter of 1983 compared with the same period last year.

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Turbo provides fresh impetus

Marketing has been intensified most notably in the U.S., the UK, West Germany, Italy and France with efforts concentrated on strengthening the dealer and service net-

Saab has been a pioneer in reorganising assembly line operations with the establish-ment of "autonomous work groups" to cut the monotony of assembly line work. It has been slower to antomate, but this is changing with the advent of more flexible robots suitable for lower production volumes. Around 20 robots are in operation today at its Trollhättan plant in Western Sweden and a further 60 will have been installed by have been installed by 1984-85.

Saab produces fewer of its own components than the big car makers but aims to gain omies of scale by buyingin parts from the large components manufacturers, chiefly in Swoden, West Ger-many, the U.S. and the UK. "For the future, we are trying to concentrate on a smaller number of suppliers—(it currently has 415)—to cat material handling costs and administration," says Rolf Sandberg, production vice-president. Saab tries, in addition, to use the development resources of its suppliers to supplement its own R and B organisation.

Recognising its limitations as a small producer, Saab has joined forces with Fist/ Lancia in a far-reaching tech-Lancia in a par-reaching termical co-operation in order to develop its new car generation. The ment model will be a further move up market beyond the 300 series—the launch is due in the second half of the 1980s.

In another co-operation deal with Fiat, Saab afready markets the Lancia Deita (sold as the Saab-Lancia 600) and the Antobianchi 112 in Sweden in order to expand the range of cars available for its domestic dealer network.

On a world scale, Saab remains a small car manufac turer, but within its chosen sector it is carving out an appreciable presence against the main competition of HMW, Mercedes-Bonz, Volvo, Andi and Rover. It claims a market share in this segment. in West Europe and North America of 4.7 per cent, up from 4.1 per cent in 1981, but a lot is riding on the dura-bility of the Turbo image as a successful marketing tool.

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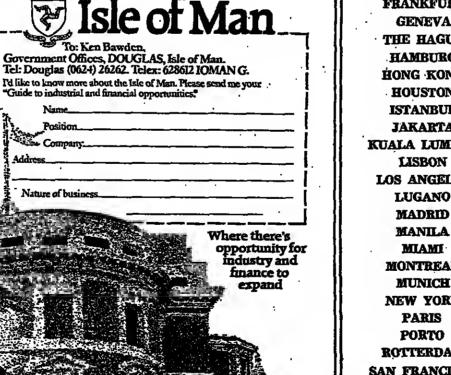
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THE ARTS

Beethoven's Tenth/Vaudeville

Ustinov's return to the London stage

Beethoven's lost sketch books indicated that he was at work on several compositions when be died, including a Tenth Symphony. What would it have been like? Longer than the Ninth and with more singers, warbling in Ancient Greek, suggests the reincarnated composer, heaving with merriment poser, heaving with merriment (and difficulty) on a chair of canvas and chromlum in the London home of a leading

Peter Ustlnov has impersonated Dr Johnson and Socrates in his time, so there seems no good reason why he should draw the line at Ludwig. To this end he bas built himself an intermiltently amusing but hardly robust vehicle which he clambers aboard when the critic's Austrian au pair (Clare Higgins) summons him from

The critic is writing a book on the "Tenth," but has no time to attend his son's own symphonies. He is vain, arro-gant, tall and pleased with himself. The au pair intervenea in a domestic row over the recep-tion of young Pascal's latest effort, and the door knocker thumps in echo of the Fifth Symphony'a opening chords.

Mr Ustinov struts on muttering German to himself in that self-contained air suggested by the Lyser drawings. It is the first hint that the heroic sculp-tures with their tempestuous scowls are not the model. The coat is indeed grubby, the physical presence bear-like, truncated. But Mr Ustinov tempers the coarse guzzling of food and goosing of the au pair with bis characteristic stage vagueness and nimble turn of

When left alone with Pascal, he demolishes the boy's work in terms of abuse more foul than the critica. This is after being sprung into English conversation by the application to

Michael Coveney joke has been milked dry, the evening subsides into a rather wearying procession of aphorisms and modestly pro-fane variations on the bio-

graphical details. The play is hest at charting the effect of Ludwig on the critic's wife, a former singer whose career has been sacrificed to her function of catalyst between husband and son. Dilys Laye blossoms in a beautiful lied, accompanied tentatively at the piano by the composer has no overpowering recollec-tion of his own work. The critic, Stepben Fauldgate

The critic, Stepben Fauldgate (admirahly played by Rohin Bailey), asks of Beethoven the two ohvious questions. The second, seeking to know the identity of the "Immortal Beloved" is a cue for an interpolated vision, witnessed by the entire family, of the Countess Giulietta (dedicatee of the "Moorlight" sonath) and "Moonlight" sonata) and Gallenberg. The latter's disdain of the composer "who smells of airless cupboards" completes the humiliation of the rejected lover.

Another over-worked myth, that of Beethoven peering at farm girls from clumps of shrubbery, is enacted with a neat plot surprise thrown in. It explains the au pair's super-natural gift and resolves the family crisis. Along the way, there are glancing parallels attempted between the father/son relationship and that of Beethoven and the nepbew be called "son," Karl.

Otherwise the text trundles along the well-worn path of acrimony between the critical and creative instincts ("You have nothing to say and you say it very well" is a typical line) and Robert Cbetwyn'a pleas-antly indulgent production allows Mr Ustinov full license to bumble, snaffle, squinny and leer in his accustomed manner. When sbown the range of Fauldgate's collection of review records, Mr Ustinov utters the startled cry "You mean critics get presents these days as well as bribes?" But such minor delights are rare, and when the genius is fed trolley-fuls of food while being treated to selected highlights from the versation by the application to oeuvre I even found myself his ear of a deaf aid by a pass- warming to the memory of ing doctor. Once this initial Amadeus,

Lear/Pit

Martin Hoyle

Shortly after Lear's loyal Elsewhere Bond can be gruehenchman had his eardrums somely funny à la Charles
plerced with knitting needles Addams or aphoristic, with
the first casualty from the
audience was carried out Fool, Lear is dogged by the
insensible. The second fainting ghost of a kindiy peasant who,
occurred as the King's eyeballs Bond. has noted, symbolises
were extracted by the latest useless nostalgia, the danger of
labour, if not pain, saving romanticising (Mark Rylance's
scientific device. Edward ingubrious winsomeness demonBond's Lear still shocks;
shocks: examples 10 portray than evil). though these examples of violence at least seem The apporent faith in natural consistent part of the goodness that exclaims "Your uman jungle peopled by barely law always does more barm than

human jungle peopled by parety anthropomorphic beasts, their crime, and your morality is a human features hiding the form of violence " is contralatent animality of, say, a Georg dicted by the lack of conviction in the compassionate set-pleces: Barry Kyle's production has the wounded soldier left to die transferred from Stratford; the under the stars and Lear's Barbican now displays the parable of the caged bird ring Shakespearian original beside false. Only at his daughter's autopsy does Lear's amazement, larting point was Lear's own bottribution to his unnatural Bob Peck, manage to move.

bottribution to his unnatural aughters' natures, and the onviction that Cordelia, like iny successful revolutionary, 'ould slide into the nld tyranny. The condemns not abuse of ower, but power itself.

The play's animal imagery successful revolutionary, is stilled: not since Grinling Gibbons has a career placed such faith in the virtues of echoes its great predecessor. echoes its great predecessor, woodenness,

likely event.

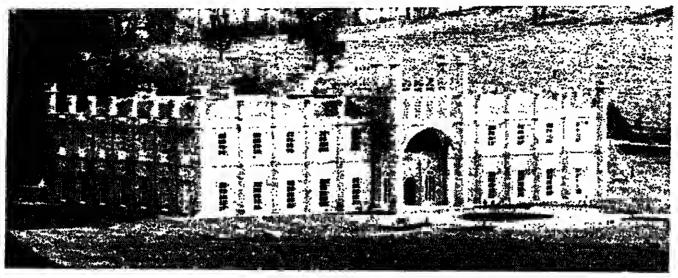
It is a splendid site and a fascinating house. The main façade is 11 hays wide and two storeys higb. The windows are divided from each other by gothic-style polygonal buttresses, each one ending in little castellated turrets. At the centre of the main façade is a tall, vaunted porch that rises to almost the full beight of the house and supports a belvedere
—a room with an almost entirely glazed front wall looking over the park.

There is no doubt that this

Architecture

Colin Amery

Aviation business flies to the rescue



Donington Hall, built in 1793 on the borders of Leicestershire and Derbyshire, newly restored as the headquarters of British Midland Airways

There is something very in-spiring and gratifying about an nearest thing that a Gothicising enterprising modern business moving into the world of The bouse is faced with a architectural conservation. For lovely mixture of local stone, an airline, in this case British the roof is covered with Midland Airways, to buy as its headquarters a crumbling ruin of a grand lete 18th century country house is a highly unlikely greet.

Donington Hall at Castle Donington on the Leicester-shire, Derbyshire borders is, by any standards, an interesting house. It was built in 1793 for the first Marquis of Hastings and designed by William Wilkins, the father of the Wilkins who designed the National Gallery. It stands in a beautiful park, lying peacefully at the bottom of a shallow bowl of hills. The park today bears only traces of its 18th century planting.

is an early attemt at a Gothic house and its interest is to see how it still follows the regu-larity of the classical models.

control of Project Consultancy new "Gothic" internal porch.
Group, from Nottingham. The Spotlights and brown fitted architects were the James carpet should be replaced in architects were the James carpet should be replaced in McArtney Partnership, also of time by a flagged floor and lanarchitect could get to e portico.
The bouse is faced with a Nottingham.

To transform a near derelict

greenish grey textured slate. The symmetry of the main front is broken by the added house that was riddled with all known varieties of rot into a beadquarters for a company that need the latest technologies chapel with its perpendicular is by any measure impressive.
Plaster cellings have been heautifully restored and elements of new plasterwork care-Donington bas suffered and been saved. In the First World War it was a Prisoner of War fully inserted. camp for German officers. In the Second World War it was

What is very clear when tour-ing the house is that the original plan is a logical one. There is an impressive entrance a billet for nfficers and the park was the largest army vehicle depot in England. Between the wars it was a family home for hall and main staircase, suitable for impressing clients today. The great rooms on the ground floor make elegant open plan Since the last war its fortunes have fallen hadly despite attempts by the owners to reoffices, with glorious views of parkland. The chairman and his coborts have grand offices nn the first floor and the top floor with the belvedere is ideal for company hospitality. garian refugees and for chil-dren of the Ockenden Venture. Until 1979 the house had been

It would be unreasonable to expect the headquarters of a growing airline to retain the atmosphere of a late Georgian country house—computers in the lower floors have replaced the housemaids. I do feel, however that the architectural advice to match the nuble intentions of the transfer of the tr tions of the company has not been of the highest pessible

terns.

The walls of the main staircase should never have been covered with the woodchip paper—and a little research would have revealed some of the original colours. There is nothing 18th century about the browns and beiges that archltects today seem to love so

The chapel is a ruin at the moment—only with substantial grants can it be restored. It was remarkable for its plasterwork and its cast iron stalls.

On the vexed question of taste and historical accuracy— It has to be admitted that architects today are woefully ignorant. This house should bave received the dedicated attention and advice that the Historic Buildings Council for England and the Georgian Group could so easily provide, It is a subtle and delicate business and one that can only

be learned slowly.
The National Trust could make its advice more available on a commercial basis if it felt able to take more of a dive into the market place. Offices are not incompatible with these houses and this exercise shows that there are enlightened comto a workplace for 400 staff.

The highly skilled construction and repair work has been carried out by a local Derby company, Ford and Weston under the project management standards.

In the marvellous hall and panies willing to step in and I am sure they would be willing to learn and pay for the skills that mar the good intentions, the ensure a more accurate and feeling restoration of country in suffer the inelegance of the

Enrique Perez de Guzman

Max Loppert

is not fully periment to or ex-planatory of them, though in Saturday's Wignium Hall recital the first-half playing of a tiranados selection was in-formed by a magisterial, and indeed faultless, comprehension of style that probaly only comes to the native interpreter.

Yet Mr Perez de Guzman would probair stand out as a musician of distinction whatever his origin; for he combines a virtuoso technique—mettled to the point of taking the most punitive Granados repeated-note figuration, the headiest bel canto glitter of the Chopin Grande Polonoise Brillante, in an easy stride — with an un-usually relaxed, measured interpretative manner.

The combination lands his execution a sense of reserve that could be taken for coolness (the last time I heard Mr Perez de Guzman in recital, in 1976, that is how I took it). Now, with the artistry matured and in control of every point and paragraph, the totality adds up to something rather more interesting and potent than that. The slower numbers of the Granados Goyescos piano-poems can have their longueurs, their moony, meandering sequenceseven the New Grove Granados of today's planists. His next entry admits to the possibility. London recital (QEH, January entry admits to the possibility. London recital (QEH, Janua Remarkably, in the first book 1984) should not be missed.

Enrique Perez de Guzman is of four, which Mr Perez de a young Spanish plauist of rare Guzman then closed with an qualities. The national adjective exhibitations El pelele, there was not the faintest danger of redum, He span out the nede die phrases with that particular mastery of line which sees to overall shape as much as to immediate poetic effert.

mmediate poetic enert.

The variety of timbre and lexture — hright and lertiliam in El tandasgo de Caudil. tapt and silken in Los requiebros and La maja y el raisennr — was compendious, yet it was above all the immaculately finished lyricism for which this half of the concent proved so half of the concert proved so unexpectedly compelling.

The Chopin aelection that followed was, in its way no less remarkable. At first, in n Ber-ceuse and Barcarolle so evenly and equably began as to seem almost pedantic, one wondered whether the voltage was not running a little low; but in each case the performance was being fastidiously shaped to lead to a grandly sustained climax.

In an encore group of Men-delssohn, Soler, and a Ritaal Fire Dance of quite marvellously aristocratic excitement. Mr Perez de Guzman summed up what the main body of the recital had already demonstrated: that his kind of playing is quite out of the common run

Eric Ackroyd/Coliseum, Oldham

B. A. Young

The Great Eric Ackroyd vited to a Buckingham Palace Disaster begins when Eric, the garden party.
champion cougher of Grindlay's Aiming even higher, he dechampion cougher of Grindlay's Smoke Works, allows two seconds of fresh air to pollute the sky over Badchester. The sky, as we see over the stage, is normally thick with black effusions from which birds fall now and then, asphyxiated. One or two fatalities result, and Eric is exiled to London in disgrace, in spite of his being needed for the works team in the Coughing Cup final at Wembley.

Bill Tidy, the author of this enjoyable romp at the Oldham Colliseum has adapted it from its original shape as a book of comic drawings. More than most other cartoonists, he likes a continuing story; we have had The Fosdyke Saga and The Cloggies and The Last Chip Shop. His writing runs like a series of cartoons, without any dull connecting material.

So in London, Eric (giventhem pay the rent. Before we call it satire, know where we are, he has become a chat-show star with a and Peter Skerrett has combined

mands, on a visit to Downing Street, that he should be made prime minister. The serving prime minister is horrified, and ensures that Eric is disgraced once more for his association with sailors and his adiction to Soapo, an intoxicant cleaning fluid. He quits public life, and sinks to the dregs; but Nellie tracks him to the Hospice of St Devius, where he is lying in a coma. Overhearing the words "Coughing Cup" he recovers at once, and secretive joins his old team for its final against Battersea Power Station (who were played en my visit hy the Rossendale male voice choir). The Badchester team wins, of course, and Eric is a

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hero again.

The humour is very broad, and seldom improper, There are some pretty songs with music by Brian Jacques; the best of them go to Miss Rosenblat, who so in London, Eric (gives, them go to miss koseminar, who a properly stereotyped, per has to work hard to beat the formance by John McArdie) four brass instruments conmets Nellie, the winner of ducted in the pit by Mark The 1975 Golden-Hearted Vibrans, I found it all very Whore Trophy (Barbara Rosen-funny; it is closely tailored to blat) at a strip club, and moves Lancashire tastes, but intellec-in with her, paying no heed to tuals allergic to these can re-the streams of sailors who help flect that in a way you could

newspaper column, and is in- with the author in the designs.

Walking on Walter/Liverpool Playhouse

aid of an Amnesty International victim called Walter, languishing in a Chilean prison. Two of these eight are only in charge of the refreshments; the odd one out is a woman living in a caravan, who provides five carovan, who provides five minules' fun, but has little to do with the rest of the play. The six proud walkers are caugh! at various moments as they tramp the gaily changing caught at various moments as they tramp the gaily changing scenery of Elleo Cairns's designs for Salisbury Plain, and Mildred is becarn by emotional mosaics what they're up 10. Sonia (Cberyl Kennedy), newly married to Justin (Christopher Martin), is determined to do her walking best for Walter, before her knees give out. But Justin is having a sneary affair with John's wife Viv (Fiona Mildred (Patricla Leach) is a drinking solicitor about to go bankrupt, and Mildred is becarn about the solicitor about to go bankrupt, and Mildred is becarn about the rage. An former county cricketer as been voted top TV play-occasional phrase suggests that occasional phrase sugges IBM UK has announced its from May 29-August 27. This arts sponsorship programme for la IBM's second significant 1283, comprising support to 30 events. The major one will be december and follows the the Royal Academy Summer successful Post Impressionist Exhibition which the above the successful Post Impressionist the Royal Academy Summer successful Post Impressionist Exhibition which takes place at Exhibition which was sponsored the Royal Academy of Arts in 1979-80.

Fans of Trufford Tanzi must Mollison), though he has to small-talk, some of which has plumh, as far as I could see, in not expect the new play hy its devote a lot of time to keeping to be stimulated by such untheirs or any others. As Ms author, Claire Luckham, to be his young pupil Sleve (Joshua likely provocations as a caged Luckham has ended the play like it in style or content. Eight le Touzel) out of the clutches monkey untended in the woods, with a comic punch-line, I take of its nine characters spend the of the gay chemist Donald or the caravan-dweller who is it she has nothing urgent to evening on a sponsored walk in (David Fielder). Steve is perfectly happy with Donald and even turns down a sexual approach from the newly-widowed Celia (Anna Nygh), who finds sex and tears the cures for her widowbood.

a while and an hotel.

juvenate the estate. It has been a welcoming home for Hun-

empty far 10 years and serious decay and rot had set in.

Because the house was mnly minutes away from the East

Midlands alroort it was bravely purchased with 29 acres of parkland (with permission to develop six of them) by British

Midland Airways. They have

spent £14m nn the restoration nf the house and its conversion

And now I've told you everything, except that Viv'a husband John tHugh Fraser), who is doing the refreshments with Mildred (Patricla Leach) is a

Donald and Sonia are both given to convenient soliloguls-

I like the scenery, with the nrdnance maps printed on every ing, though they don't take enough advantage of the habit to let up deep into their souls.

There are indeed no depths to so empty of drama can permit.

TV drama award for ex-cricketer

Houston Ballet's British debut

July 9. The company will appear at the Birmingham Hippodrome (June 13-19), at Sadier's Wells Theatre. London (June 20-July 2) and at the Palace Theatre, Manchester (July 4-9). (July 4-9).

Houston Ballet was estabished in 1967 under the artistic direction of Nina Popova, al-though its foundations were laid eight years earlier with the creation of the Houston Ballet

Houston Ballet, one of almost the whole year round America's leading ballet com- and has toured all over North panies, will make its British America. Its repertoire ranges lebut on a tour from June 13- widely from the classics to contemporary works as well as new pieces specially created for the company by some of the world's leading choreographers. In April 1982 the company

undertook its first European tour, visiting France, Italy, Switzerland and Luxembourg. British-born Ben Stevenson has been the company's artistic director since 1976.

For the British tour the com-

laid eight years earlier with the creation of the Houston Ballet Academy headed by Tatiana Semenova.

The company, which now numbers 38 dancers, has grown to a point where it performs

For the British four the company will present three different programmes including Stevenson's full-length hallet Peer Gynt. based on the play by Henrik Ibsen, with the incidental music by Greig arranged by to a point where it performs

Editor's **Proof**

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Arts Guide

Music/Monday. Opera and Ballet/Tuesday. Theatre/Wednes-day. Exhibitions/Thursday. A selective guide to all the Arts appeers each Friday.

Music

IBM's 1983 arts sponsorship

ZURICH

Tonhalle: Zuricher Chamber Orches-tra with Maud and Paul Torelier, cellos conducted by Edmond de Stoutz. Handel, Dvorak, Vivaldi and Grieg (Tue); Homera Francesch, pia-no (Wed).

VIENNA

Konzerthans (721211): Vienna Cham-ber Orchestra, conductor Philippe Entremont. Mozart (Wed); Radio Symphony Orchestra, Berlin, Vien-na Youth Choir. Conductor Riccardo Chailly. Eben, Gounod and Liszt (Thur).

n. Festival of New Music. Die Todliche Doris/Butzmann/Zev from Berlin (Tue); The Residents (Wed).

LONDON

Halle Orchestra conducted by James Loughran with Peter Donohoe, pia-no. Berticz, Rachmaninov and Mah-ler. Royal Festival Hall (Mon). (928-3191). on Sinfonietta conducted by Oliv-

Condon Sinfonietta conducted by Oliver Knussen with the Arditti String Quartet and Electric Phoenix. Britten, Maxwell Davies, Holloway, Ferenyhough and others to celebrate the 48th anniversary of the Society for the Promotioo of New Music, includes four world premieres. Barbican Hall (Mon). (638 8891).
English Chamber Orchestra directed by Murray Perahia, piano. Mozart. Royal Festival Hall (Tue).

English Back Festival: Trevor Pinnock, harpsichord. Bach and Rameau. Queen Elizabeth Hall (Tue). (928 3191).

Philharmonia Orchestra conducted by

Philharmonia Orchestra conducted by Simon Rattle with Misha Dichter, piano. Strauss, Beetboven and Dvo-rak. Royal Festival Hall Wed).

Young Musicians Symphony Orches-tra, Harlow Chorus and Nelp Cho-rus conducted by James Blair. El-gar's The Dream of Gerontius. Royal Festival Hall (Thur).

al Festival Hall (Thur).

Rounle Scott's. Frith Street: Dizzy Gillespie. trumpet. Until June I. (4390747).

Hespie. trumpet. Until June I. (4390747).

Hespie. Thur). Grantet: Brahms programme (Non, Thur). Grantet: Brahms programme (Tue, Thur). 92nd St. Y. 1395 Lexiogton Av (4274410).

PARIS

Los Angeles Philharmonic Orchestra with Carlo Maria Giulini, Gidon Kremer, Yo-Yo Ma: Brahms (Mon)

coomse Orchestre conducted by Lov-ro von Matacic with Colonne Or-chestra Choir conducted by Jean Sourisse: Bruckner (Tuel Saint-Louis-Des-Invalides Church (233 7289).

ereux' Octet: Schubert (Thur 3pm and 6pm) Salle Pleyel-Salle.

May 20-26

Philharmonia Orchestra conducted by Simon Rattle with Misha Dichter, piano. Strauss, Beetboven and Dvorak. Royal Festival Hall Wed).

London Mozart Players conducted by Tamas Vasary, piano. Mozart, Janacek and Haydn. Queen Elizabeth Hall (Wed).

Problem de Paris conducted by Rafael Kubelik with Brigitte fael Kubelik

NEW YORK Alfred Brendel: piano recital. Beethov

WASHINGTON

National Symphony: Mstislev Ros-tropovich conducting, Gwendolyn Bradley soprano, Claudine Carlson mezzo-soprano, Choral Arts Society directed by Norman Scribner. Mah-ler (Tue, Wed, Thur). Concert Hall, Kennedy Center (254 3776).

CHICAGO

Chicago Symphony: Leonard Slatkin conducting, Hanlon, Sibelius conducting, Hanlon, Successive, Vaughan Williams (Thur). Orches-

F.T. CROSSWORD PUZZLE No. 5,178

ACROSS

1 I am in a rage It appears (6) 4 Stop or start playing billiards (5, 3) 10 New cadet or nid soldier (7)

11 Prominent foreigner in the way (7) 12 Always puts a woman right (4)

13 They impressed old sailors (5, 5)

15 Stay outside or go (6) 16 A fine kick (7)

20 Lying in a case, perhaps (7) 21 Stop and bave a drink (6) 24 Coastal defence that is soon liquidated? (4-6)

26 I need nothing, thanks, or very little (4) 28 Having a roof over one's head (7)

29 Man In a whirl-engine fuel his trouble? (7) 30 May never be enough for anybody (5) 31 Badly teased, but not stand-ing for it (6)

DOWN

1 Wanting to rest in peace? (3-5)

He is named for the post (8) 3 Gathered to be all right (4) 5 Sees dirt, becomes revolted (8) 6 Loyalty is required, for instance, in a union (10)
7 It can smash a cance to

worship (6) 9 Open tarts, perhaps (5) 14 Flight path designed to carry jet (10)

17 He wili leave a permanent impression upon one (g) 12 Man's environment - geographically speaking (5, 3)

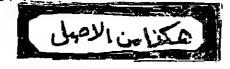
19 An outhouse in which there's warmth—just in case

8 He's fit to be an object of 22 Have ambitions for a high place in the church? (6) 23 It's used in a row or swordfight (5)

25 Give someone a sharp reminder? (5) 27 Bank of Scotland (4)

The solution to last Saturday's prize puzzle will be published with names of winners next Saturday

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Monday May 23 1983

Heart of the **Euromarket**

A SHORTAGE of about \$1.5bn taken a more purist line and in interbank deposits is the remained sceptical. We bave consistently been a solution to Brazil's second debt crisis within a year. They are deposits which some banks involved in lending to Brazil have chosen to withdraw from Brazilian banks. The argument whether such western banks should be coerced into restoring these deposits bas led to an open division between central banks which, until now, have given an impression of unity in their efforts to keep the international banking system intact

The argument is not arcane. The international market for interbank deposits lies at the heart of the Euromarket phenomenon, and the roughly \$1,000bn which international banks are now borrowing from other banks is the feedstock which has made possible many of the banking excesses of the last decade.

This interbank Euromarket bas always been much more than a market in which one bank's marginal surplus of dollars is used to fund another's marginal need. In many cases it has provided the sole source of dollars for banks which bave neither an American deposit base nor any well developed access to dollar deposits from non-bank customers

non-bank customers.

In 1981, a Bank of England study found, for instance, that Japanese banks in London were raising three-quarters of their funds in the interbank market and appearance that the property of the control of the customer banks. and consortium banks about four-fifths.

One particular class of such users of the market were the banks of developing countries like Brazil and Mexico. They used interbank funds to participate in syndicated loans to their own countries or to fund dollar loans to customers back at home. The interbank market thus became a back-door source of balance of payments finance: Brazil, for instance, had taken in about \$7.5bn in interbank deposits compared with total

debts of about \$90bn.

The lure of interbank liquidity worked both ways. Some of the world's largest banks acted as conduits into the interbank market, accepting deposits from Opec countries. for instance, and then passing them on to other banks at some profit. While such money-centre banks may define and control their direct loan-exposure to troubled countries they cannot define or control depends on the lending policies

of banks tapping the market.

Against this background, the
U.S. Federal Reserve and the
Bank of England have tended, not without misgivings, to adopt a pragmatic line in attempting be asking themselves whethe to shore up Brazil's interbank that avenue to balance-shee deposits. The Bundesbank and growth is really worth the the Swiss National Bank have margins and the risks involved.

worried by the decisions formally to include interbank commitments in the debt rescue "packages" put together by banks, central banks and the International Monetary Fund. The phenomenon of sovereign bank dept has already created illustons enough without giving official approval to the myth that money locked away in a Latin American bank is a Latin American bank is a liquid interbank deposit like any other.
It is better to tailor the

reinancing arrangement—the reinancing arrangement—the Bank for International Settlements and IMF loans, the economic adjustments required of the borrower and the longer-term bank loans—to a realistic financial position.

It is desirable also to put the central bank of a debtor country in a position where it can, as lender of last resort, supply some dollar liquidity to its own banks when interbank deposits are withdrawn. Some tacit agreement between Western banks on preserving interbank lines will doubtless still be needed, but the aim should be to bolster interbank confidence by putting together a credible combination of longer-term finance and adjustment. Bridging loans from the BIS

should continue to play a role but not a role that fosters illualons, The reserves of central banks, the lenders of last resort, must remain secure and predictably callable. If the supply of further funds from official acurces cannot be official acurces cannot be avolded at the end of a BIS bridging period, it should be secured through the IMF or directly from governments: the BIS should not be drawn into the never-never land of balance of payments lending.

Experiences

After the differing experiences with the rescues of Mexico and Brazil it seems probable that formal reliance on interbank arm-twisting will be avoided in the future. Indebted governments, commer-cial banks and their super-visors have doubtless learned a lesson in the last 18 months, analogous to the warning of the dangers of the floeting rate foreign exchange market deliv-ered by the collapse of the Franklin Netional and Herstatt banks in the mid-seventies.

In the future, countries or banks which rely beavily on interbank finance will need to be looked at more critically by other banks and by bank superuse of those funds must now be asking themselves wbether

REAGAN'S SUMMIT

the state of the s



The Williamsburg line-up: from left to right, M Gaston Thorn, EEC Commission President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Reagan, President Mitterrand of France, West Germany's Chancellor Robl, President Roble, President R

And so, back to the fireside

By John Plender

IS, so many European officials would have us be-lieve, an unstructured, highrisk affair, of which we should expect little of real conse-

The preparations have been marked by undignified squab-bling between France and the United States over exchange rate intervention. The European press is rife with scepticism.
In the United States, public

interest, in so far as it exists, focuses as much on what public relations advantage the Presi-dent will draw from the event as on the issues themselves. In all, a less than creditable curtain-raiser for the ninth economic summit at Williamsburg.
Virginia, at which beads of government confront exceptionally serious problems of unemploy-ment and financial instability. Yet the omens could still prove misleading.

Official pessimism about the outcome is perhaps understandable. At recent summits bureauto do, say and think. Heads of government bave been tied down to communiqués drafted in advance and have ended up spending much of the limited time available arguing about nuances of drafting. In recent years the number of function-aries has multiplied and the

The summit process was thus 1981 when the Ottawa meeting produced little but complacency in the face of the recession. Bathos was finally achieved at mate triumph of form over economic content, after which Presidents Mitterrand and Reagan succeeded in devaluing summitry by openly reassuring their respective electorates that they had conceded nothing on East-West trade or exchange

The novelty of the Williamsburg summit, and the cause of much of the scepticism, is that that the bureaucratic trappings journalists will still be con-demned to bunt in a pack of

the U.S., Japan, West Germany, France, Britain, Canada, Italy and the European Commission will meet on their own and debrief their ministers and civil servants without the belp of an efficient record. The foreign official record. The foreign time, will meet separately and present prepared statements to the beads of government. In effect officialdom has been

of the dollar.

Exchange rate instability.

Floating exchange rates have produced an unstable framework for international trade and monetary relations. When These three problems of the Bretton Woods system of structural budget deficits, fixed exchange rates broke exchange rate instability and

put in its place. The alm is partly to return to the style of the first summit at Rambouillet in 1975, where the leaders tried to look beyond their immediate national concerns and discussed the wider international con-sequences of their economic policies. Instead of concentrating on the preparatory work of "sherpas," the participants will lay the emphasis on the aftermath: they will provida "orientations" — a new orientations" — a new bureaucratic catchword for requests and initiatives which

will provide the basis for negotiation. The central issue this coming weekend will be the state of the world economic recovery and bow to sustain it. Most of the leading industrial countries have recently npgraded their esti-mates of growth: the fall in the oil price bas provided a useful stimulus; inflation is down; and nominal, if not real, interest rates have declined sharply over the past year. Yet by post-war standards the recovery remains weak and there is room for dis-

agreement among the summit leaders on bow far and how

fast it is likely to go.

That does not, bowever, mean that there will be any commitments, as at Bonn in 1978, for a "locomotive" expansion by the bigger economies. Even the French, after successive devaluations of the franc, have abandoned their belief in old-fashioned refationary medicine. The world's leaders seem more likely to express faith and bope in the recovery and to conduct a strategic discussion on whet steps are needed to remove the obstacles to sustained, non-

The more obvious obstacles

mop np most of the private sector's net savings for the fore-seeable future, as well as absorbing capital inflows from overseas. The deficit goes much of the way to explain the high real level of U.S. interest rates and contributes to the overvaluation that the interest rates and contributes to the overvaluation of the way to explain the high real level of U.S. interest rates and contributes to the overvaluation of the way to explain the high real level of U.S. interest rates and contributes to the overvaluation of the way to explain the high real level of U.S. interest rates and contributes to the overvaluation of the world makes it harder for less ing a discontented populace. While President Mitterrand may feel that the unstructured approach at Williamsburg contains an implicit represent vicious circle versalles, it would be surprised to the present vicious circle versalles, it would be surprised to the present vicious circle versalles, it would be surprised to the present vicious circle versalles, it would be surprised to the versalles. contributes to the overvaluation

from the present vicious circle whereby they are borrowing new money to pay interest on old debt. Debt deflation will act as a brake on the world

Attacking the Americans is the traditional resort of a French president confronting a discontented populace

down in the early 1970s, debt service are clearly inter-advocates of floating exchange rates expected currencies to adjust to underlying trade flows as they were reflected in the current account of the the current account of the balance of payments. Instead currency levels have been dictated increasingly by capital account movements; current accounts have tended to adjust to currencies instead of the other way round.

The result is an unbalanced relationship between the main currencies and particularly the dollar and the yen, whose present levels are simply not tenable in the longer run because they create inexorable pressure for protection. As the U.S. has exported demand and jobs via its balance of payments, sectoral interests bave turned protection into an important political issue.

The volatility of exchange rates also hampers sustained recovery by making capital journalists will still be condefined to bunt in a pack of
6,000. Instead of a communique there will merely be
an informal agenda and an
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delivered by President Reagan
af the conclusion.

The U.S. budget deficit.

Assuming no change in current ness and the mechanism for overvalued dollar provides.

Hence their recent criticisms of the level of the dollar and of
the conclusion.

The u.S. budget deficit ness and the mechanism for overvalued dollar provides.

Transmitting growth from country to country is disrupted.

The international debt problaw Assuming no change in current
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The combination of high
the expert opportunity that an
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tries to control the con-sequences. Yet in theory sum-mits are intended to handle precisely these kinds of issues and to provide a forum in which statesmen can transcend narrow and departmental approaches to

It is not the job of beads of government to hammer out technicalities. What they can do is to put technical issues on the political agenda and comprunicate a new set of priorities to ministers end officials, particularly in those areas where there is some indication that the beginnings of a consensus exist. What scope is there for

a major question mark con-cerning the attitude of Presi-dent Mittetrand. Since the last investment more hazardous: devaluation of the franc winning investment is the french have been more inclined to see the threat in high ments. Less investment is then ments. Less investment is then the export opportunity that an the export opportunity tha

ing if he saw the disruption of the summit as being in French Nor is he totally isolated. The

British, Germans and Japanese share French concern at the imbalance between U.S. monetary and fiscal policy and feel they have made some headway with the Americans on the

Between now and the next Presidential election in 18 months time budget cuts are politically impossible. But President Reagan should have no difficulty in putting his name to a commitment to make cuts in the so-called "out years" beyond that date and some referyoud that date and some reference to lower interest rates must surely feature.
The summit leaders may also give a push to the process of multilateral surveillance init-iated at Versailles, which is

bearing more fruit than might corders to Japanese rest have been expected. At a on agricultural imports. meeting last month IMF managmeeting last month that managing director M Jacques de
Laroslere presented a paper
which was conspicuously tough
about the U.S. budget; the
French were given a clean bill
of heelth after their recent
return to fiscal rectitude. More regular gatherings seem likely. Even on exchange rates the outlook is not bopelessly bleak. Arguments about the pros and cons of intervention in exchange. markets are probably less im-portant than overall perceptions. And there is a growing recognition that stability should be an objective of policy. Where What scope is there for the links between exchange novement?

Over the U.S. budget there is that money policy agreed that money policy agreed that money policy agreed that money policy.

in the U.S. budget deficit. Assuming no change in current in informal agenda and an agreed statement to be delivered by President Reagan at the conclusion.

The U.S. budget deficit. directed towards export business and the mechanism for overvalued deliar provides. Hence their recent criticisms of the importance of money supply on him to prove to the deficit try to country is disrupted.

The eight participants from the u.S. budget deficit. directed towards export business and the mechanism for overvalued deliar provides. Hence their recent criticisms of the importance of money supply on him to prove to the officials try to country is disrupted.

The eight participants from the conditional resort opportunity that an overvalued deliar provides. Hence their recent criticisms of the importance of money supply on him to prove to the officials try to country is disrupted.

The international debt problem. The combination of high real interest rates and growing the American fiscal policy.

Assuming no change in current to downgrade president Reagan. The country is disrupted.

The conclusion.

The u.S. budget deficit. directed towards export business and the mechanism for overvalued deliar provides. Hence their recent criticisms of the importance of money supply on him to prove to the officials try to country is disrupted.

The international debt problem. Assuming no change in current to downgrade president Reagan. The country is disrupted.

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The conditional resort business and the mechanism for overvalued deliar provides. Hence their recent criticisms of the importance of money supply on him to prove to the officials try to country is disrupted.

The international debt problem. Assuming no change in current to downgrade president Reagan. The country is disrupted.

The conditional resort to downgrade of the importance of money supply on him to prove to the officials try to country is disrupted.

The international debt problem. Assuming no change in current to downgrade of the importance of money supply on

Unlike finance ministers, however, heads of government are not closely identified with specific fic methods of targeting. If they wished, and if they had the imagination, they could said for a study of different approaches to financial targetry. Similarly, they could be study of the could be supposed to the could be gerry. Similarly, they could by pass sterile erguments about exchange rate intervention and call for studies of different methods of exchange rate stabilisation as a preliminary step towards the new Bretton Woods conference that President Mittersand has promosed.

terrand has proposed.
On direct trade lesues there is a general expectation that the summit could result in the summit could result in a call for more ministerial meetings of the GATT. The Americans have also been presiding for more specific institutional links between trade and finallicial issues. But the French are hostile to this initiative. And the whole area of trade policy is littered with banama signs for summitters, because of their own recent bad behaviour our issues ranging from East-West, sconomic relations, to European imports of video cassette recorders to Japanese restrictions

corders to Japanese restrictions The achievements of a summit lie as much in the damage it prevents as in the specific measures it sets in train. If the outcome of Williamsburg however low keymakes it even modestly less likely that high real interest rates and currency instability. rates and currency instability persist; that France, with its back to the wall, takes a quantum unilateral leap towards protection; that Japanese relations with the Western summit countries are permanently impaired; that the U.S. remains unconcerned at the international amplications of domestic policy; and thet LDCs move closer to default and despair, it will have been worth-

It would be foolish to deny the scope for trouble, even with specific problems on exchange rates, East-West trade and the

Simpler fares for **London Transport**

the Greater London Council's Fares Fair scheme for a cheaper and simpler system of urban transport charges was killed off by an unsympathetic inter-pretation by the Law Lords of a badly drafted piece of 1960s transport legislation. The deleterious effects of that

ruling bave been daily evident throughout the capital: exceptionally high fares, forced by the judiciary onto a GLC elected with cheap fares as the main-stay of its manifesto, bave driven tens of thousands of travellers off the buses and the underground into private cars. Buses lost 16 per cent of their passengers, the underground lost 12 per cent; simultaneously the inner and outer areas of the capital became choked with cars and already difficult parking

Today the GLC is baving another, rather more carefully prepared attempt. Fares will fall on average by 25 per cent. Most importantly, a travel card is introduced for the logical and simple zoning system and is valid for both buses and underground - a vital first step towards commuter fares integra-

Inevitably there will be a few losers—a few fares will go up, a few people will face the same or slightly higher costs without the benefit of an underground service. But the main principle of the system is to be welcomed: a simple exercise in comprehensible transport economics designed to attract passengers and alleviate a problem in need of a radicel approach.

the GLC bas been its own worst mediocre, unimaginative and enemy in presentation of a ambiguous legislation in this range of policies, many of which country. A mixture of flair while of insignificance or no cost and care is required and the bave proved offensive to a large latest GLC move appears to be number of ratepayers. Not sur- showing the way forward.

prisingly, the council may pay the utimate price if the Con-

servatives are returned to power: it will be abolished.
But in the field of transport, at least, it has demonstrated a creditable attempt to make sense of London traffic today and an sible fare structures and levels.

The next logical step is to find a way through the maze of complexities surrounding British Rail fare structures so that eventually all commuter fares in the capital's suburban catchment can be sensibly integrated

Commitment

This aim appears to lie partly behind the Conservative manifesto commitment to create a London Regional Transport Authority. But while the desirability of integrated fares is proven it is still far from clear that such an authority would be the best vehicle for implementing the policy. It is not clear from the manifesto what form the new body would take but the intention is apparently that it should be an appointed rather than elected board with-out the power to precept on ratepayers. If this means a super-quango eppointed by and financed from the Transport Department there could be a serious diminution in accountability which would not be in the best interests of either tax-

payer or farepayer.

Any new Transport Secretary of whatever political colour will face an immediate and urgent task on the whole subject of urban transport policy, not only for London but for all of Britain's metropolitan cities. It f a radicel approach.

is a subject which for some
The Labour administration of reason attracts particularly

Kodak snaps

American businesses, acutely conscious of shareholder power and pressures, are becoming much tougher about the standards of service they require from professional advisers such as accountants

Yet Eastman Kodak has broken new ground in that direction by secretly investigating the law firm that acted for it for nearly 40 years— Donovan Leisure Newton and Irvine of Manhaftan—and than confronting the firm with

charges of malpractice.

In an out-of-court settlement that followed Donovan Leisure paid Kodak \$675,000 and secured an agreement that the matter would not be given

while Kodak has observed the agreement by keeping mum for a year it has felt obliged, nevertheless, to answer questions if they are put by shareholders. So Fortune, the U.S. business magazine, recently bought 10 Kodak shares to secure the facts of the investigation and settlement. gation and settlement.
The events began in the

early 1970s when Berkey Photo, e New York photosinishing company, sued Kodak for monopolising the market for cameras, film, and developing equipment. Donovan Leisure led Kodak's defence. But it was discovered during the trial that Donovan Leisure had withbeld material which Berkey had a right to see.

The jury awarded Berkey \$113m damages from Kodak after the missing material was unearthed in the final days of the hearing.
Kodak fired Donovan Leisure.

Later the case was settled on appeal by Kodak paying Berkey

which took two years.

As a result of the investigation Donovan Leisure paid So it is intended that 1983 will keep the series of a year ago.

Men & Matters

its reputation as a law firm because of the affair. It still represents such major com-panies as Mobil, Walt Disney Productions, and American Cvanamid.

But on both sides of the Atlantic the affair is being seen as a pointer towards a growing disincilination by companies to let their professional advisers' mistakes go by default As I mentioned the other

day, the Law Society representing British solicitors is raising the cost of its professional

He moved on to the Black indemnity scheme for providing Rock desert and reached 615 insurance cover by 15 per cent mph—the record is 622 mph in the autumn. Its decision has been influenced by eight claims for more than film each which

members.
In America roughly 5 per facing malpractice claims each year — although it should be year — although it should be said that the rate is much lower in the highest echelons of the

Paid up

Any motor industry magnate who drives up today to the elegant forecourt of Forbes House, the Belgravia bead-quarters of the Society of Motor Manufacturers and Traders, and expects to park will be out of Big charge

All the places will be occupied by just one car-an all-British product so long that by in the world.

comparison even a Rolls-Royce A joint public sector-private

an out-of-town law firm, Drinker endeavours by bosting the Biddle and Reath of Phila-delphia, to conduct an inquiry which will be made later this

Donovan Leisure has not lost engine (with reheat) is opened un on a dried lake bed in the Black Rock desert, Nevada. In 1981 and 1982 his efforts to bring back to Britain the world land speed record which Donald Campbell lost to the Americans in 1964 were bedevilled by the weather.

The team was flooded out on the Bonneville sait fists in 1981 by a "once-in-a-century" rainstorm—as the locals called it. Last year, bowever, the same flats were hit again by

mph—the record is 622 mph—before he was once again driven off by rain.

Now the sponsors and some are in the pipeline against 200 other companies which members. project believe this will be their lucky year. For e welcome change with this type of proneed to spend more time fund-raising. The sponsors have stood by him after the previous adversities. And the Project Thrust Team itself took the ject Noble and his team do not precaution of underwriting against St Swithin's Curse in 1982—thus securing a hand-some pot of money for this

In America the Energy Daily has tracked down what it believes is the biggest battery

However, Kodak was extremely concerned that the public was in dobut whether Kodak had participated in its London businessman Richard Rolls-Royce A joint public sector-private sector venture called the Battery Energy Storage Facility (BEST) was opened just over a year lawyers' misconduct. It hired Noble's world land speed record crack the problem of storing

commercial quantities of electricity for use in peak-load

Now BEST has a 1.8 megawatt bour lead acid battery which is running — all 674 separate battery cells of it — in its own building. Without such pampering as air conditioning or heating the battery is reported to be working reliably. It takes in mains electricity at night and is discharged during the daytime over a five-hour period. Its direct current output is con-verted back into mains electricity.

BEST is going ahead with work on other battery systems — zino-chloride, zino-bromide, and sodium-sulpbur — and Al Pivec, the programme manager, is forecasting that large-scale industrial electricity storage using batteries will be in use as early as 1990.

Pirate post

No parts of the islands of Jersey and Guernsey are more than a few miles drive from the respective airports. But the Lilliputian ecale of Channel Islands geography is not stopping the islands' postal services from insisting upon full delivery and collection rights for all

the independent Jersey and Guernscy administrations still have monopolies for the carriage of mail.

The Jetsey Post Office has now enlisted the aid of local

customs officers to spot packages being brought into the island by private courier services, or taken to the airport for dispatch. Any air-freighted package

ought to be stamped with the correct postage to convey it between the airport and the local address. Otherwise the postal monopoly is infringed.

Observer

HOW MANY TIMES HAVE YOU NISHED YOU COULD JUST STUFF IT DOWN THE PHONE?

We can put a desk top machine in your office tomorrow which will send an A4 document — anything you can write or draw - anywhere in the world in 35 seconds with perfect darity. It's called FAX, and we've been the leaders in this fast-moving world since the dawn of high speed facsimile transmission. When you were about eight years younger than you are today. But one of the range we can offer you now is one quarter the size of the machine we could offer you then, and costs less than half as much. And now

it can communicate with tens of thousands of FAX installations throughout the world. To leading companies in many fields our FAX is already as familiar as the telephone or. telex, and preferred for speed, accuracy. versatility and economy. Look for



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VENTURE CAPITAL IN BRITAIN

The high-tech money bonanza

By Tim Dickson

RICHARD CROWN was a hot supply of funds for experimen-property in the City of London tal research and development

last month.

When word got around that his tiny husiness WordNet needed new funds for development, no fewer than 16 possible backers apparently stepped forward, chequebooks at the ready. The object of their interest—a small device which terest—a small device which links typewriters to word processors—had chalked up impressive sales in its first few months of production but further progress was being hampered by a lack of adequate working capital.

Beseiged by offers on all sides Mr Crown opted to accept £250,000 from a reletively unknown investment company Yelverton Investments—in exchange for 25 per cent of his

change for 25 per cent of his shares in WordNet. A measure of the interest is that at least two fund managers admitted later being bitterly disappointed that they had not landed the deal. And a measure of the range of terms offered is that one thought ba stood a sporting chance demanding the same equity stake for exactly half as

equity stake for exactly half as much money.
Such a story vividly illustrates the City's current passion for unquoted investments and its headlong dive over the last couple of years into "venture capital." Dozens of specialist funds are now touting for business, merchant banks and certain investment trusts have stepped up their profile in the certain investment trusts have stepped up their profile in the search for high fiyers, govern-ment agencies abound with "risk" money if you know where to look for it, and even banks, insurance companies and pension funds are occasionally throwing their traditional cau-tion to the wind

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tion to the wind.

The competition for good investments is intense and those individuals with an exciting business plan and a dash of salesmanship are certainly

making the most of it.
Yet while the private sector's record in backing small com-panies has greatly improved, gaps in the market remain and important lessons still have to be learnt.

 City institutions, for example, are still largely obsessed with the company which can show some sort of track record, requires between £100,000 and film, and enjoys above-average prospects (preferably based on a high technology product). • Genuine start ups as a result are generally shunned and the

projects is even more inadequate.

● Even those established com-panies which cannot project dramatic earnings growth con-tinue to have trouble finding

• The UK, moreover, is at a relatively early — and some would say confused—stage in adopting the techniques and style of American venture

Sometimes rather inelegently called tha "hands on " or " proactiva" approach, the American influenced style of venture capital is distinguished by a high degree of involvement with the companies being backed, often to the extent of hixing managers, providing technical know-how and above all supplying marketing skills.

Venture Capital Journal, the bible of American venture capitalists, reckons that perhaps \$5.50n has been invested in this way over the last five years in this way over the last five years in the United States and that, spurred by a reduction in capital gains tax in 1978 and the increasing use of new issue markets (which allow venture capitalists to each in on their capitalists to cash in on their success) the pace has quickened in the last couple of years.

Details of the fortunes made

by early investors in computer companies such as Apple and Tandem are now well known-Rleiner; Perkins, Caufield and Byers, the lead investor, achieved a 100 to 1 return in Tandem. But it was when stories such as these first began filtering across the Atlantic that those in Europe were encouraged to believe that similar sults could be achieved here By contrast to the 300 to 400

independent venture capital firms in the United States—each typically with perhaps a couple of technically qualified partners as well as financial specialists mine venture capitalists in the UK are still few and far Technical Developmen

Capital (TDC), part of the Finance for Industry Group (FFI) is certainly one. We're geared up to put in at least 30 doing anything spectacular (the man days per year on each "walking dead" in venture client," explains Geoff Taylor, general manager, who supervises a portfolio of 22 will make the whole exercise companies. "At the outset we worthwhile. probably spend a lot more



Ronald Cohen, managing tially lucrative unquoted invest-director of the £10m APA ments has attracted fund Capital Fund, agrees. months building a management involved. team to run its latest computer software investment.

control in Advent Technology and Advent Eurofund.

David Cooksey, Advent'e managing director, explains that his colleague Michael Moran has been despatched to California for a while to run a new San Diego subsidiary of Leeds-based Filtronics. "That's hands on if ever it was," Mr Cooksey said. Most British and Continental institutional fund managers, on

the other band, are still characterised by the "win some, lose some" philosophy. This approach has long typified the UK merchant banks, which have tended to take the view that while a couple of companies in a portfolio of 10 may go bust and six may survive without Some observers worry above all that enthusiasm for poten-

managers with little experience of backing new companies and He and his colleagues here just of backing new companies and spent much of the last six little understanding of the risks Geoff Taylor at TDC believes

that "the pendulum has prob-ably swing too far" and that Perhaps the biggest force in ably swing too far and that the market is Advent Manage—there is bound to be a shake ment, with some £20m of out in a coupla of years' time institutional money under its when certain operators realise when certain operators realise the extent of the risk." Norwich Union's recent annual report underlined some

of these risks. It disclosed that Castle Finance, the company's risk capital subsidiary, lost money last year. Gavin Mills, chief investment manager, con-firms the group has already written off film in a portfolio which bas fam invested in 26

But he says the risks can be over emphasised. "We are well aware that you have to have strong nerves. Before we set up Castle we had, over the years, invested £7m in 42 unquoted companies. These are now worth £16m-£17m. This proves you have to be patient."

In the U.S. venture capital funds have also developed strong nerves. But there too "there are venture capitalists "there are venture capitalists This ready supply of money A major task for the next chasing awfully hard to get is not making life any easier British Government It theremoney invested" said Gordon for venture capital funds. Where fore likely to be to divert funds Moore, chalrman and chief once they could expect companies to them, now market.

don't deserva support." But risk assessment is not the only problem, particularly in Britain. "There is still a far Britain. "There is still a far from perfect match between money and investments," says David Beattie, managing director of Grosvenor Development Capital, originally a spin off from the old Netional Enterprise Board, but now an independent development capital ontfit.

A former industrialist whose filom fund has committed just over £5m to 10 companies, Mr Beattia adds, "Tha very big deals of £7m or £8m are sometimes difficult to back whilst start-ups require a special sort of expertise." And too much of the available money is directed at the glamorous, but relatively small high-technology section of the market the market

The Unlisted Securities Mar-ket (USM), where shares of some fledgling companies have soared to dizzy heights, has quick ride of perhaps three or vantages, are widely used but four years before they sell out in the UK they are virtually unat a profit.

managers are increasingly find-ing that they have to take the

Increased specialisation, says Tony Lorenz, managing director of Equity Capital For Industry and vice-chairman of the British Venture Capital Association, can be one answer for funds, "Too many funds launched recently have too diffuse a purpose. Those that have e fine focus towards any particular areas of high technology—are known in tha market place and are still seeing a steady flow of sensible propositions."

But the largest and most experienced provider of long-term loan and equity finance for smaller companies, Industrial and Commercial Finance, Corporation (ICFC) insists that it is holding its own against the com-petition. Its continued success owes much to sound marketing —a branch network, links with financial advisers and referrals from existing customers - but also to a greater readiness than most to back sound companies start ups and not necessarily the go-go stocks of tomorrow.

interview. "I believe they are supporting a lot of things that Two gaps, bowever, remain.
First sound companies whose capital base has been eroded over the years — by inflation or the recession — still find money hard to come by. The proposed Business Expansion Scheme, which allows indi-viduals to claim tax relief on investments up to £40,000 e year in a wide range of established trading companies, is expected to belp bere.

The other major gap is for research and development pro-"The big problem area is between university research grants and start up money" says David Cooksey of Advent. "This is where the British Technology Group and the Govern-ment should in my opinion con-centrate its main efforts."

It is estimated that in the U.S. perhaps half the venture capital money goes to early staga ventures where it is used primarily for product develop ment. In addition research and greatly accelerated this trend, development partnerships.

Many fund managers want a which offer attractive tax ad-

Lombard

Why share prices matter

By Richard Lambert in New York

bull market. At best, politimost expensive component of cians tend to look on a steep the overall cost of capital.

rise in share prices as a mark

A new study produced in the of confidence in the wisdom of their policies — welcome, but not too relevant. At worst, they regard such an increase as a conspiracy by a handful of heartless speculators, who are profiting at the expense of tha great mass of the public.

market is capable of making a direct and significant contri-bution to the national well being. The most obvious reason stems from the impact of a rise in share prices on the finances of individual citizens. It has of individual citizens. It has been calculated that the value of consumer hald stocks, bonds and liquid assets in the U.S. rose by more than \$500bn (£321.5bn) in the second half of 1982, thanks to the explosive nerformance of Wall Street. Over time, this extra wealth will be translated into a measurable increase in consumer out-

More significantly e bull market also increases both the willingness of companies to invest in new plant and equip-ment, and their ability to do so. During the 1970s, the price of just ebont everything rose steeply — except for equities. A share in AT and T was worth 120 packets of cigarettes in 1970—and just 81 packets in 1980.

As a result, the market value As a result, the market value of U.S. corporations fell from well over 100 per cent of their net worth in the lete 1960s to under 50 per cent in 1979. And since it didn't seem to make much sense to invest a dollar of cash into an asset thet would immediately be valoed at 50 cents, companies tended to pare back their capital spending.

So long es it was cheaper to acquire a factory by buying an existing business than by building on a greenfield site, takeovers flourished et the expense of new capital invest-

ment even more attractive to

THREE CHEERS for the great equity is by far the biggest and

A new study produced in the U.S. shows just bow far the bigh cost of capital has handicapped American industry in the past decade: the message would apply just as strongly in the UK context.

In this analysis, the cost of In reality, bowever, a bull at which expected future dividends (as perceived by a com-pany's managers) must be discounted in order to arrive at a present value equal to the stock market valuation of the com-pany's shares. In other words, if a company wishes to issue equity to finance a project, it can't just work out the cost of the present dividend: it must also take into account the im-pact of dividend increases in the future.

> Calculated in this way, the real cost of equity after tax in the U.S. jumped from around 6 per cent to 10 per cent as a result of the bear market of the mld-1970s.

During the past ten years, the analysis concludes that the cost of capital in the U.S. has been more than three times that pre-vailing in Japan — largely because debt financing makes np a much larger proportion of company balance sheets in Japan than in the U.S.

Whereas in 1981, a U.S. manufacturer would have spent \$6,700 for labour and \$3,300 for capital for a given amount of additional output, the study says that a Jepanese manufacturer would have had to pey only \$3,900 and \$1,000 respectively for the same output.

The precise figurework may be open to debate, but there is no escaping the sheer scale of Jepan's capital cost advantages. Every point on the Dow makes the comparisons look less daunting — so let the bull mar-ket roll, and let's hear it for the FT 1000.

High cost of Copital; Handi-This paper shuffling has cop of American Industry. By enriched some stockholders, but Dr George Hatsopoulos. A made little contribution to the study produced by the made little contribution to the study produced by the overall economy. The bull American Business Conference market will make new invest- and Thermo Electron Corporation. Available from Thermo companies and make it cheaper Electron, Attention Ms Delia to accomplish. This is because Mitchell, 105 Bishopsgate, Lonin both the UK and the U.S. don, EC2.

Letters to the Editor

advisabla

J. David, 1, Coneydale,

to lose

Welwyn Garden City, Herts.

thought profit an undesirable

objective. But nowadays most firms in Comecon are expected

lose hard currency. R. S. Musgrave.

From Mr R. Musgrave

Points of international comparison on employment

Sir, — It appears (May 17) that Mr Healey has argued that "Norway, Sweden, Austria and Japan had kept practically full employment right through the recession of the past 10 years by following the sort of policies

proposed by Labour." parison can be found hetween the policies followed by these itries and Laboura proposals (in part because Labour matter, but, on this, comparison from an exhaustive list). It has so many propeals) is more difficult. The Labour would be ironic if, promptly although the differences between, for example, the mit-business policies and conserva-tive attitudes to economic change of the Labour Party and the polices and attitudes of the

Looking for staff

From the Managing Director, Securon (Amersham).

Sir, — As a relatively small company in Winchmore Hill, just between Amersham and fligh Wycombe, we employ at the moment some 100 peopla and are fortunate enough to bave orders but find it very difficult to engage staff.

we use the Careers Office, which tells us there just aren't any about, we use the Job Centres, who tell us that the only people they have on their books are the ones who don't want to make the ones who don't want to work, and in response to advertisements for secre-taries, inspectors and the like, we get two or three applica-

We would point out that we we would point out that we are not looking for a bonus to employ people on the Youth Opportunities Scheme at £25 a week, but people working for us, providing they work reasonably hard, earn £30£120 per week.

R. A. Proctor. Securon, Winchmore Hill, Nr Amersham, Bucks.

Dioxin and orders of toxicity

true that one-millionth of a gram of dioxin per kilogram of bodyweight would swiftly kill a human being, and nobody knows because dioxin has never yet killed anybody, it is still true that the 200 grams diluted to 2 tonnes has been diluted 10,000 times and this would

or of the U.S. under Mr Reagan, easier to find. They include Mr Healey is perfectly correct neither of which has yet proved such economic disasters as

to be an outstanding success. Such singla points of compari- Chile, Manley's Jamsica, Ecevit's son are irrelevant. It is rather the combination of policies that Party's proposals for protection after the Falklands war, Britain after the Falklands war, Britain expendition, expanded government consumption and investment expenditure, rising Martin Wolf.

38, Peckarmans Wood, SE26.

grammes per kilogram of body-would increase to unacceptable weight which is at least in the levels. order of toxicity of many quite familiar substances.

The European chemical Industry moves some 3m tonnes of dangerous and toxic waste across borders in Europe in the course of a normal working year and many tens of times that quantity will be disposed of safely within national borders. The industry works to satesy borders. The industry works consistently to improve its safety record but it can only do so on the basis of objective

To add to all the problems generated by the political interest in dioxin has been the "Hooverisation" of the very name. In fact the very hazardous chemical generated at Seveso was a specific isomer of tetrachlor-p-benz-dioxin. This is formed when certain asymetric chlorinated phenois react. Virtually all phenois, however, are capable of forming dioxins and it must be one of the largest family of chemicals hitherto unrecorded simply because they only appear as impurities of phenola, many of which are important industrial raw materials.

raw materials. the Eastern variety are guided
If the term dioxin is extended by "state goals rather than beyond the specific isomer then private profit." This is misleadproducts widely used in dis-infectants, antiseptics, preserva-tives, adhesives and detergents, ontaining dioxin waste is an dioxins. A ban on phenol based illustration of the political chemicals would be a hacklash importance of dioxin. If it is of imposing secondary true that one-millionity of imposing secondary. of imposing severity and firms in Comecon are expected immense economic effect to produce a raturn on capital Similarly, if manufacturers of just as in the West Further-

industrial chemicals are called more, countries desperately upon to maintain standards of short of Western currency are purity which have been bardly likely to eet up operapurity which have been required for materials which might possibly contain TCDD, ie parts per billion, then the 10,000 times and this would costs of manufacture of many 24 Garden Avenue, give a fatal dose of 10 milli- of industry's basic materials Framwellgate Moor, Durham.

Steel demand and Ravenscraig

Japanese government are, I would have thought, more striking than the similarities. Mr Healey could, however, have pointed to more interesting comparisons, even among industrial countries, for example, to the expansionary fiscal policies of France under M Mitterand or of the U.S. under Mr Beagan.

Kavenstral grow the Director and extensive government control Secretary, British Iron and Secre Six—Dr Jeremy Bray asserts
(May 16) that I present a
scenario of savage defiation etc
as being the limit of what can be expected in terms of future steel demand. In fact I only pointed out that Cambridge Econometrics highest forecast still left a margin of 5m tom Peron'e Argentina, Allende's excess capacity in the UK roughly three times Ravens Turkey and Lopez Portillo's Mexico (and this is very far craig's capacity. About half that excess would be in strip mills, which answers Dr Bray's assertion that I ignored the

question of product mix.

I must also admit, after 15 years' experience of forecasting in the engineering industry, to a certain scepticism about poli-ticians' forecasts based on assumptions of sharply in-creased future economic

In all this perhaps it is In a short letter there was also no space to deal with quality issues to which Dr Bray also refers. He is clearly unaware that for many years my council has pressed British Steel Corporation and the Government of the covernment of the covernment of the covernment. to remember that even the Seveso dioxin has never caused a fatal accident and where it has been possible to study its effects on humans objectively and scientifically, whether at Seveso or at other ment to maintain quality im-proving and cost reducing infactory accident sites, includ-ing one in the UK, none of the vestment, e.g. in continuous casting. That is vital to BSC's long term effects feared have been found. The most severe result has been chloracne, a skin casing. That is vital to BSC's competitiveness and that of its potential customers. We are assured that it is BSCs intencondition which improves on treatment, and which, inci-dentally, is not a disease; any-respectable virus holds far more destructive potential in a single cell than all the dioxins gver made. tion to maintain such invest-ment, e.g. at the remaining strip mills. If BSC, or taxpayers (through the Government) are unable or unwilling to afford this investment because the U.S. deal fails through and surplus capacity is retained at Bavens craig at great cost, the conse-quences for competitiveness, and so jobs, in steel and the steel using industries will be serious indeed.

Dr Bray writes that BSC's strip mills "have now been Sir.—According to your articla strip mills "have now been asked to produce at their full capacity up to August." It is a pity that he did not make it clear that this referred to manned capacity "which is only two-thirds of "plant capacity."

I will not repeat the arguments in favour of the U.S. deal (my letter of Wer 10). One of on Comecon multinationals (May 18) the latter do not think they should be likened to Western multinationals because

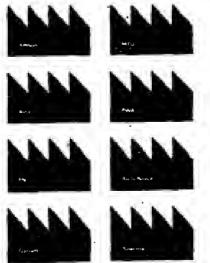
ing beceuse the state's goal normally is to make a profit.
Of coursa the idealistic revolutionaries in Russia 50 years ago its advantages would be to make the jobs of more than half those currency employed at Ravens-craig, and some in Wales, no longer a burden on the tar-payer. The money saved could then be invested in infrastructure projects in areas particu-larly hard hit by unemployment thereby creating more "real" thereby creating more "real" jobs, not least in the steel and steel using industries.

tions in the West that aim to J. F. Safford. 16, Berwyn Road,

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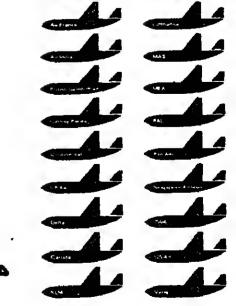




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FINANCIAL TIMES

Monday May 23 1983

Atlantic

air talks

to discuss

FURTHER efforts will be made in

talks starting today to improve Anglo-U.S. civil-aviation relation-

ships, which are at their lowest lev

pricing

el for many years.



cent since the beginning of the

year, more-or-less regaining the

ground lost against the FT All

Nevertheless, a yield premium

2 percentage points over the index

even allowing for the usual differ

ential, underlines the uncertainties

still hanging over the sector. Prices have to stand the test of a long summer of slack demand. The recently denied stories of Iran breaking

ranks are a symptom of the edgi-ness in the market as sen-Opec pro-

duction strengthens, notably in the

The extent of the North See up-

last week's first-quarter figures

from Shell, which generated most

of its reported profits increase from its upstream activities. Shell was admittedly benefiting from the very high sterling price of oil but it also gained strongly from the 118,000 barrels aday rise in production, mostly in the North Sea.

mostly in the North Sea.

In the current quarter, North Sea production companies can again be expected to gain from higher production, although losing ground on the currency play—sterling's steady strengthening against the dollar will reduce their shelter against the

cuts in dollar-denominated oil price.

But the strength of production is it-

self a cause for concern, since it

means that pressure on Opec sales

could re-emerge.

Renewed jitters about Opec could

in turn cast a shadow over the smaller North Sea exploration com-

panies. The tax changes have only just made some of the figures on

marginal oil fields add up satisfac-

torily, felling prices would unscram-ble all these sums. In this situation,

the defensive qualities of the inte-

grated majors look even more of a

virtue. If oil prices again come un-

der pressure, this might at least

swing was to some extent evident in

Share index.

Terry Byland on Wall Street

Dangers of rising M-1 sink in

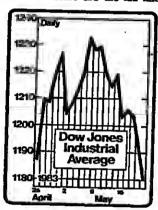
SHARE MARKETS in the U.S. have been slow to respond to a shift in investment attitudes after the renewed rise in M-1 money supply, which has already stopped the bond market in its tracks. But equities analysts at the leading brokerage houses are now beginning to sound a more cautious note and this week will bring a general updating of the investment advice offered to important clients.

Tha new mood of uncertainty, which brought some sudden set-backs for share prices last week. differs in kind as well as in degree from the warnings of a pending "correction phase" to be heard up and down Manhattan a month or so

The merchants of the correction-phase theory were left looking fool-ish more than once last month when the market brushed aside the profit takers and soared to new

This time, however, the warnings are being voiced more seriously and are finding more sensitive nerves in

To a large degree, the market's



brought up to date with more convincing statistics. The difference is that the market is taking the worries more seriously this time round.

The increase in M-1 money supply, now that the strength of the economic recovery is clearly established, has added teeth to the fears that interest-rate trends - and the Federal Reserve's credit policies may be coming under pressure.

A trip round the analysts last week suggested that the debate over interest rates has moved smartly out of the relatively academic climate of last February and into the equity market place.

As recently as two weeks ago, the equity market was only too willing to see the rise in M-1 as, hopefully, a correction to distorted totals in April, and share prices held firm despite some nervousness in the bond market

But the equity market has under-gone a somewhat belated conver-sion to the views summed up by Mr Peter Canela, portfolio strategist at Merrill, Lynch, Pierce, Fenner and

The money numbers are not going to gn down, they are going to go up, be commented bluntly last week. The Federal Reserve Board may be able to keep short-term rates steady but the writing is on the wall at the longer end of the bond market, where prices have already fallen sharply.

On the other side of the equation, the strength of the economic recoving plants and warehouses. The UK market is probably the most under-developed among the major Euroery in U.S. business is now well established and last week's disclosure of a sharp rise in personal incomes has been noted as perhaps the first hint that inflation might not yet be ever, been encouraged to move into AGV production by British indus-try's new interest in flexible manu-

Putting all those trends together. the brokerage analysts are now advising their clients to reshuffle their portfolios to protect them-selves in the event of a tightening of credit later this summer.

Mr Alan Schwartz, director of research at Bear Stearns, advises a industry will be able to source lo-shortening of maturities in bond cally all the major hardware reportfolios, accompanied by selective quired for manufacturing or hanselling of equities, "to raise cash to go back into the market later."

The message was repeated by other brokerage houses. Most at dling automation projects.

risk are likely to be the smaller, high-technology stocks which stood out in the early days of the market advance. Many of these companies would find it hard to raise money if credit conditions tightened, and the share prices have recorded gains beyond credibility

Bullishness for the longer term remains unimpaired - the leading industrial companies will be showing substantially improved results in the third and fourth quarters of this year, as the economic recovery works through the system. Mainframe computer makers, defence stocks and financial-services issues are all recommended as safe havens during any period of market shakeout.

The next six weeks should prove an interesting time for Wall Street. As long as fears of tighter credit conditions prevail, the equity market will remain nervous. But if the days of easy share profits are over for a time, the winners will as usual be those who saw the writing on the wall first. industrial companies will be show-ing substantially improved results in the third and fourth quarters of

Bonn 'failing to protect German steel industry'

BY JAMES BUCHAN IN BONN

A LEADING West German steel maker sharply attacked successive Bonn governments for failing to protect the battered German industry from subsidised European competition, and raised the prospect of compensatory border tariffs against subsidised steel imports.

Dr Dieter Spethmann, chief executive of Thyssen, Europe's largest private steel concern, and chairman of the West German producers' fed-eration, accused Bonn of "even today still failing to understand prop-erty" the problem of subsidies, above all in the UK, France, Italy and Belgium which be said, had amounted to a cumulative DM 80bn (\$32.5bn) since 1975.

*Nn private concern can survive

in competition with the united finance ministers of Europe," Dr Spethmann said in an interview with the Hamburg magazine Der Spiegel at the weekend. While Dr Spethmann poured

most of his scorn on the former Social Democrat-liberal government he left no doubt that he included Chancellor Helmut Kohl's new centre-right government in the charge that Bonn has "no steel policy at all." Count Otto Lambsdorff, the economics minister and thus re-



Dr Dieter Spethmann: 'failure to understand'

sponsible for steel, has kept his post through both administrations. However, Dr Spethmann did say German representatives would show greater "backbone" in getting subsidies dismantled. Ironically, the German steel industry led by Thyssen is demanding billions of D Marks from Bonn - and approval sures," he said.

from Brussels - to push through cuts in capacity to meet the steel

Dr Spethmann also repeated his proposal, first outlined in a letter to Chancellor Kohl last autumn, for border protection against subsi-

"Why should we be left exposed to illegal practice in Europe, when the U.S., for example, knows how to defend itself?" be said, referring to the imposition of compensatory import tariffs in the U.S. last year which led to a transatlantic squab-

Dr Spethmann also sharply criti-cised the Klöckner-Werke concern. which was expelled from the feder-ation be has headed since 1974 for exceeding European Community crisis production ceilings. Klöckner is refusing to pay fines imposed by the European Commission, could amount to DM 200m.

Underlining Klöckner's all but complete isolation in the troubled West-German steel community, Dr Spethmann said that its "overproduction" had cost the other concerns billions of D-Marks. "Brussels and Bonn must take drastic mes

Businessmen aim to restore British links with Malaysia

BY CHRISTIAN TYLER, TRADE EDITOR, IN LONDON

UK makes late bid

FOUR British companies, Lansing Sweden's Tellus and BT groups, Bagnall, Babcock FATA, Fenamec Schindler, which makes the Digitron AGV in Switzerland, and

for robot market

A HIGH-LEVEL British trade the BOTB, said: "We hope that it attitude and lack of sensitivity to mission to Malaysia is being organised to mark the formal end last of normal good relations with Malaysian policy of securing 30 per cent national ownership of the

month of business hostilities.
Senior industrialists and bankers chosen by the British Overseas Trade Board (BTOB) will visit Kuala Lumpur in October. The visit will take place almost exactly two years from the day when "buy British last" policy was decreed Dr Maha-thir Mohamed, the Malaysian Prime Minister.

The provisional list of visitors includes the chairmen, or senior executives of Thorn, Rolls-Royce, Rank Xerox, Metal Box, Scicon, Lloyds Bank International and the Commonwealth Finance Corpora-tion. They will be led by Lord Jellicoe, former chairman of Tate & Lyle and now chairman of the

BY PETER BRUCE IN LONDON

and Dexion, are in competition to

put the first domestically manufac-

tured automated guided vehicle

(AGV) on the market before the end

nf the year.

AGVs, slow-moving platforms

guided by under-floor wires, are used widely in the rest of Europe,

especially Sweden, France, West

Germany and Italy, in manufactur-

The UK companies have, how-

facturing systems, and by a sharp increase in the number of automat-

ed warehouses being ardered this

Manufacture of the AGV will

mean that for the first time British

The AGV will complement an es-

tablished machine tools industry.

and growing investment in robotics and high-speed warehouse retrieval

Although the Japanese, notably

pean industrial countries.

year in the UK.

Dr Mahathir announced early last month that in future British goods would again be treated on the same basis as those of their compe-

That followed his meeting with Mrs Margaret Thatcher, the UK Prime Minister, in London and a UK Government decision to raise by £46m (\$71.8m) over three years the amount of scholarship money for foreign students at British universities - of whom many are Ma-

The Malaysian Prime Minister had announced his edict while a previous British trade mission was n Kuala Lumpur in October 1981. Investment as well as trade will Among the reasons he gave was be on the party's agenda. Mr Christopher Roberts, chief executive of nessmen had shown a patronising

Wagner and Jungheinrich of West

Germany, dominate. Mannesmann Demag, of West Germany, recently

tightened the European grip on the industry by buying out the biggest U.S. manufacturer, Barrett Elec-

Lansing Bagnall, Britain's big-gest producer of forklift trucks, and Babcock FATA, a Babcocl. Interna-

tional subsidiary, are developing their own AGVs for the British mar-ket. Both Dexion and Fenamec,

tems and is part of the J. H. Fenner

engineering group, are seeking manufacturing licences from for-

ket. The company is also collaborat-

ing with Warwick University on the

Babcock FATA hopes to have its

roles in automated warehouses, an

wire guidance.

| Total | Tota

Komatsu, are in the AGV market, area in which it already has consid-

European manufacturers, such as erable experience.

World Weather

country's assets.

He also complained about new London Stock Exchange rules after a Malaysian state company's take-over of Britain's Guthrie Corporation, and the cut in scholarship

Despite the decree, Britain's exports to Malaysia showed an increase last year. Worth £224m in 1980, they fell to £196m in 1981 but rose to £221m last year. However, businessmen estimate that many millions of pounds worth of contracts may have been lost while the pecial scrutiny was in force.

A fall in the sterling exchange rate helped to keep British goods on the market, and Dr Mahathir himself at one stage said the effect of the edict had been "very, very mini-

World Trade News, Pages 3, 4

Thatcher holds strong lead

Continued from Page 1

Conservative strategists will be hoping for no repetition of the open differences last week between Mrs Margaret Thatcher and Mr Francis Pym, the Fnreign Secretary. Mrs Thatcher yesterday dismissed as "totally and utterly untrue" reports that Mr Pym had told her he would leave the Government if he was removed as Foreign Secretary after

Mrs Thatcher said Mr Pym had no such conversation with her and "he is very distressed at that totally false report."

Our Belfast correspondent writes: The leaders of the two nival Unionist parties in Northern Ireland yesterday issued a joint statement warning constituency parties of the danger of Sinn Fein election victories if single Unionist candidates are not agreed.

Lansing has already developed prototypes, and is likely to put a range of machines of varying de-grees of sophistication on the mar-The statement from the Rev Ian Paisley of the Democratic Unionists and Mr James Molyneaux of the Official Unionist Party appeared to be the closest they were likely to get to an election pact before nominations development of a free-ranging AGV system which would dispense with

There are six key constituencies first AGV on the market by July. The company plans to manufacture AGVs specifically for distribution where a split Unionist vote would open the way for a Nationalist victory. Mr Paisley proposed that each ry. Mr Paisley proposed that each party would fight three seats. Attempts to find agreement continued over the weekend.

in opinion polls

and it is making its own, separate investigation into the affair, to dis-cover whether any "criminal" acts against the U.S. anti-trust laws have been committed.

If either the Laker liquidator's ac-

tion or the Justice Department's investigation goes against the airlines, they could face heavy financial penalties in the U.S. The airlines have denied both ac-

port Association, of which both air-lines are members. In addition, they claim that

Bermuda Two, but the Department of Trade still firmly believes that the U.S. Justice Department's ac-tions are covered by the treaty. Moreover, the officials believe that while it may be possible for an

Nigeria debt progress

should be undertaken only as part of a more comprehensive approach by international banks to the country's financial problems.

One U.S. banker involved in talks on Nigerian debt both in Europe and the U.S. said at the weekend that "substantial progress" had been made at the New York talks. been made at the New York talks.
F 27 78
He said the latest proposal reflected
a major change of direction in the
attempts to deal with Nigerian debt
and was much closer to the U.S. and was much closer to the U.S. bank's original position.

In return, the U.S. banks appear nancing before any formal IMF pro- longer experience of Nigeria

so severe that such a refinancing gramme is in place. Talks aimed at reaching agreement on an extended fund facility of up to \$2.6bn have begun, following a formal approach by

> The Nigerian talks are proving to be among the most complex of the series of country reschedulings now under way. One of the main problems has been a lack of accurate information about the size of the ar-

U.S. banks have been concerned that discussions of solutions to the arrears problem has concentrated prepared to participate in the refi- in European banks. These have THE LEX COLUMN

A long haul for cable

If Mercury and BT prove reluc-

tant, large companies are likely to dominate the industry. Established

heavyweights such as Rediffusion

and Electronic Rentals are likely to

be joined by the new entrants such

as Granada and Ladhroke. These companies have their own taxable

capacity, which means they can utilise 100 per cent capital allowances

to the full when installing a cable

base. By contrast, BT's capital ex-penditure already far exceeds its

profits, so that in spite of its inbuilt

advantage of having cable ducting already in place, its net capital costs may exceed that of some of the

For large concerns, the 12-year franchise period still poses a prob-lem. It allows an effective term of

perhaps only seven or eight years for debt finance, which could be too

short, given the long-term nature of

Meanwhile, estimates of the re-turn on investment are unreliable.

It is possible to make a stab at

costs, but demand remains an un-

known. However, it looks as if the level of the return will be highly

geared to three main factors - pene-

tration, the initial capital cost, and

the price consumers are prepared

to pay. The most recent studies suggest that the returns may lie in the

10 to 20 per cent range - which is not wildly compelling. On this ba-

sis, the Government may come un-

der pressure to lengthen the fran-

chise period to the 15-year mini-

The sight of Opec finally shaking itself back into some sort of pricing order, to say nothing of the UK Chancellor of the Exchequer way-

ing a magic wand over North Sea

mum granted in the U.S.

Oil sector

tors should be at no disadvantage. first tonic since last summer. After stream marg But it looks as if BT or Mercury will badly lagging the market through stock losses.

The White Paper on cabling Brithave to provide strong support for the autumn, it has risen by 24 ain, released last month, leant over these players in the intermediate cent since the beginning of backwards to meet the requirements of the business cable lobby. Yet after the initial enthusiasm last year, when cable consortiums were being formed on what seemed to be a weekly basis, the atmosphere has turned rather flat.

Primarily, the talks, to be held in London, will be aimed at persuading the U.S. Justice Department to In large measure this reflects the drop its planned anti-trust investi-gation into alleged price-fixing hy British Airways and British Caledoevaporation of euphoria wafting over from the U.S., where the new generation of cable companies have found the going extremely tough. Nevertheless, behind the scenes, nian Airways (BCal) on the North Atlantic air route. But other topics might also be several companies with large resources remain committed to gain-ing a foothold in the new medium, raised. One is the U.S. Government's attitude to a separate legal action being taken in the U.S. by and there are likely to be around 20 very serious applications for the 10 or 12 pilot projects mooted in the White Paper.

operators have a major problem in

securing finance in the build-up

phase. In the early stages, the nega-tive gap between income and the rental charged by BT could be wide.

Yet without physical assets as a se-

curity, banks will probably be un-willing to advance loans to support

the loss-making period. Once a sys-

tem is mature, small-scale opera-

the liquidator of Laker Airways, alleging that British Airways and BCal conspired to drive Laker off the North Atlantic. of the widespread recognition that the pay-off for investment in cable Annther issue is whether the UK should license the new U.S. transat-lantic operator, People Express, to fly a cheap-fare service between London Gatwick and New York will be very long-term as well as ris-ky. The initial capital expenditure – involved in putting in the cable net-works — is high, while revenue builds up slowly. It will take some Newark, New Jersey). The airline, approved by the U.S. Government, wants to start on Friday, and is already taking bookings. years to push up to the necessary penetration of households, then lat-

The UK Department of Trade, how-ever, feels it is being pushed too fast and wants more time to review the airline's financial and other caer on still the income stream is boosted as additional services, such as data communications, are added to the base load. At this stage two types of opera-tor seem to be interested in estab-lishing a presence; large companies which want to run and instal their There is also a long-standing and increasing U.S. disenchantment with the overall scope of the Anglo-U.S. Bermuda Two air treaty, which own cable systems, and smaller operators interested in leasing net-works established by British Tele-

U.S. airlines have for long claimed benefits British civil aviation at the com (BT) and Mercury. The small expense of the U.S. - a claim the UK rejects. There have been many sugges-tions in the U.S. air transport indus-try for a review of the treaty. It

might be that that will prove the best way of clearing what is in-creasingly becoming a difficult area of Anglo-U.S. trade relations. Either side can give one year's notice of the desire to end the trea-

ty. The current difficulties surfaced several months ago, when the liquidator of Laker Airways decided to file a suit in the U.S. against BA and BCal, alleging conspiracy to drive Laker off the route by offering low fares that Laker could not match. The airlines deny the charge, and are defending the ac-

tion vigorously in the U.S.

They have also tried to obtain a UK court ruling that the matter should be settled in Britain and not in the U.S., but that was rejected in he UK High Court last Friday by Mr Justice Parker. An appeal is to

The U.S. Justice Department's in-terest in the North Atlantic air fares has been aroused, however.

cusations. They have argued strongly that their actions are governed by a blanket immunity from U.S. anti-trust laws granted by U.S. acceptance of the fares, agreed within the International Air Trans-

where the UK is concerned, all Ang-

where the UK is concerned, all Anglo-US, civil aviation matters are governed by Bermuda Two.

The ruling by Mr Justice Parker in the UK last Friday – pending appeal – may mean that the Laker liquidator's action is not covered by Barmada Two but the Paraginant

individual to bring an action in the courts against the two airlines, the Justice Department itself, as an arm of the U.S. Government, is

be some sympathy in other branches of the U.S. Government

Some timely

oil taxes, has given the oil sector its feed through into better down-

first tonic since last summer. After stream margins - whatever the

for companies contemplating

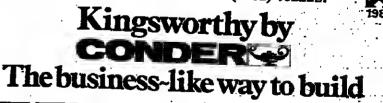
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SECTION II - COMPANIES AND MARKETS FINANCIALTIMES

Monday May 23 1983

EUROBONDS

How an innovative deal can fall flat

BY MARY ANN SEGHART

THE EUROBOND market is proud sterling bond? Fixed-rate? Floatrants, partly-paid deals, zero cou-pon bonds - these are just some of the ways the market keeps its head above water during uncertain

es, however, the product of hours and hours of imaginative investment bank thinking is given hardly a nod by the market. If a deal is too complex the market may grumble rather than cheer. Witness the case of last week's new deal for Crédit d'Equipement des Petites et Moyennes Entreprises (CEPME) an innovative issue which got only an

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Hill Samuel's new idea for CEPME was a fixed-rate Eurosterling bond, which is convertible into a dollar floating rate note. The 12-year, £30m bond carries a coupon of 11% per cent at par. During the first five years of its life, it can be converted into a dollar FRN paying the six-month London interbank offered rate (Libor).

At first glance, it appears ingeni-ous. And from CEPME's point of view, it is relatively cheap. Investors are sacrificing about 70 basis points on the straight bond and 40 basis points on the floater for the sake of the currency conversion op-

Hill Samuel conceived the bond as a hedge against a weaker pound should the Labour Party win Britain's general election. But it also found that the issue attracted interest from dollar-based floating rate note investors who receive nearly two extra percentage points of yield on the straight bond and can convert to floaters if sterling weakens.

At first, the market was mystified tors were starting to bite, though, the middle men were less enthusiastic, "Where do I trade it?" asked one dealer. "Is it a dollar bond? A dollar markets.

Apart from trading difficulties, the bond is also difficult to value. One large fund manager explains:
"If you're too innovative, you may frighten off some of the market who don't understand the deal. Even if you like it, it's not always easy to persuade your clients to buy

One new issue manager summed up the ambivalence many feel to-wards innovative deals: "What I would like to see is a plain vanilla straight bond correctly priced - that would be a real innovation in this

Elsewhere in the Eurodollar market, some \$345m worth of bonds was launched last week, almost all of it on Wednesday when the sixmonth Eurodollar deposit rate fell from 9% to 9 per cent. Short-term dollar rates were higher last week than they have been for about a

Deposit rates in D-Marks and Swiss Francs also rose last week, which might explain the lacklustre atmosphere in those markets.

however, beld up surprisingly well last week in view of the poor perfor-mance of the New York bond market. The larger-than-expected M1 money supply figures from the week before last showing an increase of \$4.2bn gave the New York market an attack of the jitters.

Prices in the Eurodollar market. though, fell only by about 14 point on the week. One reason may be that Europeans are less bearish about interest rates, but what is by the deal, but the price picked up more likely is that Cootinental infrom a two-point discount against vestors are taking a view on currenits issue price of par to just over one cy movements rather than interest by the end of the week. While investable, and the dollar has recently been strong.

This week is likely to be quiet in both the primary and secondary

HONG KONG MAY TAP EUROMARKETS

Politics and credit risk

BY PETER MONTAGNON IN HONG KONG

THE HONG KONG Government has been dropping tantalising hints to the foreign banking community thet it may need to borrow next year to cover its budget deficit.

Last year the Government ran e deficit of HK\$3.5bn (U.S.\$497m). This year, despite some sharp increases in indirect taxation, a further deficit of HK\$3.4bn is projected. The deficits will be met by drawing on reserves built up by years of accumulated surplus, but by the end of the current fiscal year in March 1984, net fiscal reserves would be down to only about HK\$8.6bn

If the deficit continues into 1984. the government has indicated that it will resort to n "modest" amount of horrowing. No decision will, how-ever, be made until later in the year when a clearer impression of this vear's public accounts can be

Nonetheless, the prospect of e rare borrower entering the Euro-

markets has already caused considerable speculation in Hong Kong borrowing was relatively short-term. Unlike dentists, bankers, it especially in view of the political seems, would be only too glad to question mark hanging over the colory's future - the British lease on of Hong Kong.

the New Territories expires in 1997. They may not have to. Hong The debate also shows up yet Kong could still decide that it does again the wide disparity in credit not need to borrow after all, or it risk assessment between the bond may choose instead to borrow short-term Hong Kong dollars in the local money market. This will In normal times Hong Kong depend on whether its identified might be considered an excellent needs are foreign exchange costs or candidate for the bond market be-not - though one argument against cause of its established record as an local borrowing is that it could exporter and its tong tradition of cause unwarranted upward pres-prudent fiscal management. The intrusion of the political problem ap-Yet expectations in Hong Kong pears to put all that out of the quesare such that there could even be e

tion. "You couldn't sell Hong Kong degree of disappointment among to a dentist in Bruges," said one the foreign banking community if having dropped the hint, Hong On the other hand the rarity of Kong decided not to borrow. "After the name and the presence of many all," says one interested banker, foreign banks in Hong Kong means "nothing could do more to boost foreign banks in Hong Kong means "nothing could do more to boost that the colony could get away with confidence in this place than a syna very low margin on the syndicat-ed credit market, especially if its Kong Bank and the Bank of China."

INTERNATIONAL CREDITS

Little progress on Brazil debt

not been finally resolved. Broadening the talks beyond the refinanc-

ing of short-term trade arrears

in keeping with Nigeria's needs.

ms both more realistic and more

Nigerie has succeeded in doub-

ling the maturity of the refinancing

loan to three years, even though

sion of the banks to establish n co-

ordinating committee and economic

Nigeria's overall debt situation. The

banks concerned point out that it

has yet to be established whether

tuling is needed.

Today is crucial for Chile since it

is the deadline by which commer-

nittee which will look at

THE MAIN preoccupation of inter-national bankers during the past month is also likely to be requested. week has been Brazil and Nigeria. Efforts to resolve the Brazilian problem and, in particular, the resoration of \$1.5bn interbank lines, have been complicated by conflict-ing attitudes among leading Westem central banks. While the U.S. Federal Reserve Board and the Bank of England bave urged commercial banks to maintain interbank lines, several European cen-

tral banks have been less insistent. If there is no reversal of some mercial banks' refusal to restore interbank lines, the option of e new \$1.5bn commercial bank loan becomes increasingly likely, together with a possible approach to the U.S. Treasury.

Brazil is already some \$800m behind with its debt repayments and its boundity crisis will be heightened by the possible delay of up to a month in the disbursement of the next tranche of the IMFs \$4.9bn loan. As a result, delayed repay-ment of the \$400m instalment of its

selves to the package rescheduling \$3.4bn nf debt which falls due this With the switch in venue from year, new loans of \$1.3bn and the London to New York the Nigerian negotiations appear to heve made restoration of some \$200m in shortterm trade credits. progress, even if the situation has

Although Argentina appears to have met its first-quarter IMF tar-gets - the IMF board will be meetng this week - and so will be able to draw down the second tranche of its \$1.5bn IMF standby facility, it seems little nearer getting the pro-posed \$1.5bn medium-term loan from commercial banks.

The Central Bank has still to anof credit involved. But the possibility of new money, which the Nigeri-ans have wanted all along, has been nounce new terms for refinancing the \$4.8bn short-term private sector considerably increased by the decidebt and the \$1.4bn in swaps.

Meanwhile, lawyers for the banks' co-ordinating committee heve bad little success in attempts to get the bankruptcy laws changed to alter the position of foreign bank creditors of Cellulosa Argentina, whose \$150m foreign debts are no present subordinate to those owe

CURRENT INTERNATIONAL BOND ISSUES															
Borrowers	Amount m.	Maturity	Av. life years	Сопроя %	Price	Leed Manager	Offer yield %	Borrowers	Amount III.	Maturity	Av. Efe years	Coupon %	Price	Lead Manager	Offer yield
U.S. DOLLARS								Meisei Ind. Co. ""5‡	30	1988		35/8	100	Banca del Gottardo	3.625
St. Western Fig. Corpe. 51	58	1998	15	7₹/2	100	CSFB	7,500	IADB #	190	1993 1988	-	61/4	108	CS	6,125
St. Western Fin. Corpn. 5‡ Honda Motor 5‡	100	1998 1998	15 15 16	51/4	180	Mike Secs., Nemera Intl.	5.250	Regami Tsoshinki ** 51	28	1988	-	33/4	100	Nomura (Switz)	3,750
America St	1 00 20	1992	16	•	100	Morgan Grenfell, Shearson/Amer.	7.500	Montreal Urban Disty. ‡	108	1993	_	53/4	180	CS	5,750
FIRCA 5†	28	1998	7	R	881/2	Baue Gertsweller Kurz Bungener		Isveimer II	60	1981	-	874	991/2	Chasa Mank. (Suisse)	8.457
Amedoo S‡ EMCA S‡ Sumitomo Bank ‡	190	1990	ź	107/2	991/2	Saloneon Bros., Samiteme Fig.,		Deutsche Bank ***	150	1988	_	5¥s	100	SBC	5.125
			-			Citicorp., Soldman Sacks	10.981	lishin **5	48	1989	-	•	100	SBC	5.125 5.375
Credit Chicelese ++	. 60	1998	7	540	190	Morgan Stanley	_	Rhein-Kraftwerke ""1	28	1990	_	5	100	CS	5.000
Pirelli 4+	48	1988	5	63/4	180	CSFB, SBCI	6.750	Malaysia **!	180	1988	_	61/4	983/4	SBC	8.551
Credit Chionique †‡ Pirelli ¶‡ Sandoz š	58-6	1995	121/2	5-51/2	100	UBS Sees	••••	Japan Exim Benk	108	1991	-	•	•	SBC SBC CS SBC SBC	5.551 5.500
Mitge. Bank of Dermark †‡	86	1998	7	540	108	Nomura Secs.	-	STERLING							
n_MARKS								CEPME of	30	1995	11.4	11¼	108	Hill Surpoel	11.250
D-MARKS SATS	108	1998	7	81/4		BHF-Bank						_			
Bennet †	150	1990	Ž	9	190	Doutsche Bank	8.000								
Renerit ‡ Anns ‡ Air Counde ‡	180	1988	5	81/4	108	Bay, Vereinsbank	8.250	GUILDERS							
Air Counds †	190	1983	10	7%	991/2	Deutsche Bank	7.448	Asian Dovt, Bank ‡	158	1993	10	23/4	99	ABN, Amer Brank	8.905
Credit Fencier de France **‡	100	1991	8	8	106	Commerzhank	8.800								
								YEN		1.00		17974	-0.5		
SWISS FRANCS								Danisk Export Fin. **‡	Store	1993	9	8.5	188	Mitsui Trust	8,600
Henda Motor 51	100	1993	-	31/2	100	UBS	3.500	Rautarwide Oy **	5bn	1993	B	8.5	188	Mitsubishi Trust	8.500
Honds Meter 5" "!	180	1988	-	31/2	108	UBS	3,500	Kores Deut, Bank ‡	18bs	1990	7	8.6	993/4	Nomera Secs.	8.649

* Not yest priced. İ Frand terras. ** Pfacement. 🕇 Hossing rate note. 🖉 Nichanne, 🖇 Convertible. 🕆 With warrants, 18 Includes FARI tranche * Convertible Into a dollar FRAI. Note: Yields are calculated on AIRD basis.

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Banque Bruxelles Lambert S.A.

May, 1983

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U.S. BONDS

Renewed concern over interest rates hits prices

chairman of the Fed, repeated

that the board does not view

Ml as "e useful tool" and Wall

Street's economists got the message emphasising that the

broader money supply measures M2 and M3 remain within the Fed's target ranges.

tinuing hefty Treesury funding need and the threat that the

While any real problems would be likely to surface next

year rather than this, corporate bank borrowing remains depressed and that is a serious

The market has recently benefited from a slight reduction in Treasury auctions because of the debt ceiling

However, as Salomon Brothers

The Treasury still has to raise

\$33bn before the end of June and the market will get a taste

of things to come this week with the \$7.75bn auction of

three-year notes tomorrow and the suction of \$5.75bn of five-

The other factor which the market and the FONC are watching closely is the strength

of the U.S. recovery, Most business leaders and economists agree that the recovery is still

fragile and patchy. Nevertheless

the economic deta continues to

confirm that it is under way.

Despite this the inflation figures continue to look healthy.

The April consumer price index

figure is due out tomorrow and

will certainly be a closely

Paul Taylor

year notes on Wednesday.

factor in market sentiment.

up pushing

recovery picks up interest rates higher.

battering last week reflecting extreme nervousness in the market about short-term interest rates and Federal Reserve

In the government market the Treasury long-bond closed at around 961 after the Fed announced another many than expected increase in M1. The Friday price drop brought the decline for the week to almost three points and to elmost five points in the past 10 trading sessions. The long-bond gress and the administration to reach agreement last week on reducing the size of the expected budget deficit. This failure implies a continuing hefty Treasury funding announced another much largor than expected increase in M1.

ment market was mirrored in the corporate sector. Corporate bond nrices foll by over two public sector will crowd out corporate borrowers as the

and a half points while new issue volume slipped to \$775,000, e 53 per cent decline

over the previous week.

The market's poor performance reflects e number of factors which the Fed's policy-making Fedoral Open Market Committee (FOMC) will also have to face when it meets points out, "the Treasury now has to make up the \$5bn paydown of bills to bring itself heck to the original cash target in a period of particularly beavy issuance."

Interest rates remain of primary concern. Last week short-term rates continued to nudgo upwards. The threemonths-Treasury bill rate closed at 8.29 per cent on Friday compared to 8.14 per cent e week ago. The Fed funds rate also moved higher averaging about 2.6 per cent over the past five

The main factors pushing up interest rates and bond yields over the past two weeks have been renewed concern about the money supply growth coupled with fears about the implication of a continuing budget deficit.

The \$7bn increase in M1 reported on Friday followed e \$4.2bn jump the previous week. This surge unnerved the market despite reassuring words from the Fed, administration officiels

Wheelock Marden pays same despite downturn

When an extraordinary gain of HK\$127.5m and an unrealised

The delay in publishing the

group's annual report has given down exchange gain of HK\$1.8m are added impetus to the rumours

WHEELOCK MARDEN, the cents for A sheres and 1.8 cents the group to assist it with Hong Kong shipping, trading for B shares making unchanged liquidity problems. Minority end property group, had e totals of 30 cents and 3 cents shareholders could object to the sharp fall in net profits respectively. There is also to loan plan according to brokers. In 1982, down to HK\$192.4m be a bonus payout of 5 cents (U.S.\$27.6m) from HK\$535m in for A shares and 0.5 cents for rates coupled with the poor state of Hong Kong's property while the profit of the state of Hong Kong's property and the profits of the group to assist it with the group to assist it with the profits of the group to assist it with the profits of the group to assist it with the profits of the group to assist it with the profits of the group to assist it with the group to assist it with the profits of the group to assist it with the group to assist a state of the group to assist and a cents a market have combined to pull down Wheelock Marden's results from 1981's high levels.

taken into account the group's circulating that Wheelock had At the half-way mark Mr John atributable profit totals had a bad year in 1982. On Marden, the company chairman, HK\$322m, down more than 50 Friday its shipping subsidiary, had warned that no early imper cent on last year's Wheelock Maritime Interprovement could be expected in national, reported a net loss the company's performance. However, Wheelock is mainable and said that it is seeking a loan given the state of two of its taining its final dividend of 18 of up to U.S.\$12m from within three areas of operation.

Nippon Chemiphar suffers Y1.8bn loss

TOKYO - Nippon Chemiphar, tion to produce and distribute the Jepanese drug company, some new medicines, made a net loss of Y1.8bn. The company is

made a net loss of Yl.8bn (\$7.7m) in the year ended March 31, compared with an after-tax profit of Yl.34bn

The loss reflects the cost of an 80-day suspension of its business ordored by the Heakh and Welfare Ministry after the company admitted fabricating climical test data in order to

The company is to cut its dividend total to Y7.50 per share, including a Y5 interim dividend, from the Y10 paid for dividend, from the Y10 paid for 1981-82.
Sales fell to Y16.86bn from Y22.81bn with the total comprising Y12.84bn in the first half of the financial year and Y4.02bn in the suspension-hit

ond half

extraordinary loss of Y1.34bn, including Y222m from the suspension of its two factories and V876m from the disposal of drugs, the sale of which was banned by the Ministry. Nippon Chemiphar said it expects to report a net profit of about Y300m on sales about Y13bn in the current year, ending March 31, 1984.

Big demand for Saudi bank shares

JEDDAH—The Saudi Arabian Ministry of Commerce bas approved 8 share allocation scheme to cope with massive public response to an initial stock offering by the Saudi Com-mercial United Bank (SCUB). According to officiels more than 418,000 Saudis made sub-scription requests totalling more than 7m shares in the offering, when the bank had allocated only 1.31m shares for public ownership. Each share has a par value of 100 rivals (\$29).

The floated chares will be distributed roughly in proportion to each applicants subscription Formed last December. SCUB

is an amalgamation of United Bank of Pakistan, Melli Iran, tho Lebanese Banque Liban et D'Outre Mer, and International Saudi Bank. Ninety-five Saudi husinessmen also are co-founders of the new bank, based in Riyadh with a capital of 250m riyals.
Of the bank's 2.5m shares each of the four founding banks owns 250,000 shares, while "constituent subscribers" hold 1.19m shares, and the remaining 1.31m will be owned by the pubkc. AP-DJ

First-quarter fall for Atlas Copco

ATLAS COPCO, the Swedish cent from 8.2 per cent in the manufecturer of air compressors and mining equipment has announced 1983 first quarter pre-tax profits of Kr70 (\$9.3m) expected efforts to increase down from Kr155m for the sales and fationalies operations, first quarter of 1982, AP-DJ together with lower net interest reports from Steckholm. reports from Stockholm.

First-quarter sales totalled Kr1.87bn, down slightly from Kr 1.88bn and corresponding to a decline in volume of some 15 per cent

The company hlaimed the prolonged recession in world in throughpu markets and higher foreign from Oslo. exchange losses for the lower olume sales and earnings. The from NKr 3.2bn in 1981, while first quarter profit margin, Atlas profits after tax were NKr 223m Copco noted, dropped to 3.8 per

to the same level as 1982, when profits before appropriations and taxes were Kr 330m. O NORPIPE, which owns the Ekofisk pipelines and terminals, has reported lower turnover and

profits for 1982, reflecting a fall in throughput, Fay Glester adds (\$3.1m), down by NRr 15m.

Fresh capital for Air France

It is proposing to repay FFr E13.1m of debt by cutting the nominal value of its shares to Fr22 from FFr 40, reducing its capital to FFr 999.9m from

PARIS — Air France is proposing a capital restructuring to cover part of the losses in its 1982 accounts. The airline reported e FFr 791.78m (\$106.6m) loss for 1982.

It is proposing to repay for the conversion of loans from government into shares. The government holds almo

directly.

President for Sheraton Corp.

Mr John Kaploltas has been named president and chiof operating officer of SHERATON CORPORATION, the international hotet groop. Mr Kapioltas was senior vice-president of the company, which is



a subsidiary of ITT Corporation, and was also president of Sheraton Management Corporation, Sheraton'o Europe, Africa, Middle East and India division where he will be succeeded by Mr Wollaston G. Morin, who will be based in Denham, England. For the past two years, Mr Morin has served as executive vice-president, Sheraton Management Corporation, and director of operations support for the

Mr Edward E. Hickam has been elected senior vicepresident and group executive of the exploration & production group of TEXAS EASTERN TRANSMISSION CORP, e Texas Eastern Corp subsidiary. He also aerves as president of subsidiary Texas Eastern Exploration Co, which is responsible for Texas Eastern's domestic and international exploration and producnational exploration and produc-tion activities, Mr Hickam Joined Texas Eastern in 1981 as vice-president and group executive of exploration and production, the position he held prior to this eppointment.

Mr Howard C. Homeyer has been appointed to the newly created position of vice-president and depute to the programment. created position of vice-president and deputy group

executive of the gas group. He will also serve in the newly created capacity of executive vice-president of Texas Eastern Cas Finaling a division and

Cas Pipeline, a division, and Transwestern Pipeline Co, a subsidiary. Formerly, Mr Homoyer was vice-president, financial planning division. Mr J. Michal Consaway, who was formerly director, corporate planning division, has been named director, financial and corporate planning. Mr Conway will retain responsibility for corporate planning, which will be transferred from the strategic development group to the

Mr Colin G. Campbell, president of Wesleyan University, and Mr Worth Loomis, president of The Dexter Corp, have been elected to the boards of directors. for eight mutual funds managed by CIGNA INVESTMENT MAN-ACEMENT CO, a company of

● Mr George D. F. Lamborn has joined ACLI INTER-NATIONAL COMMODITY SER-VICES, INC as president, chief to the diagnostics segment of the executive officer and chairman worldwide health care market, of the executive committee. Mr Most receotly he served as Gottsman was president of ARA the bank's economic model of Lamborn has served as co-corporate vice president with Transportation Inc.

INTERNATIONAL APPOINTMENTS

Fontaino and Mr Gordon R. Farker directors, Mr Fontaine has been vice-president, finance, of Newmont since 1979, Mr Parker joined Newmont in 1981, as vice-president, operations, after having served since 1975 as managing director of Newmont's affiliates, O'okiep Copper Co in Cape Town.

ALLIED CORPORATION has appointed Mr Peter J. Schiller as president of Instrumentation Laboratory, Inc. II. was acquired by Allied at the end of last month. Mr Thomas A. Rosse, who founded II. in 1959, will continue as chairman. He will provide overall policy guidance, particularly in research and product development. Mr Schiller, who has also been appointed executive vice president—diagnostic operations of Allied Health & Scientific Products Co, will heve overall responsibility ALLIED CORPORATION has will heve overall responsibility for Allied's growing commitment

and chief executive officer of Union Carbide Corp, from which be retired in 1981. Mr Glesen was president and chief executive officer of Fleld Enterprises, Inc. a publishing, communications, and real estate company. Mr Bernard Imseng. senior

wire-president of Union Bank of Switzerland in Zurich, has been elected to the newly-created posi-tion of vice chairman of CEDEL. • Mr James M. (Jim) Køane bas been named president of THE FANTUS COMPANY INC, a subsidiary of PHH Group Inc. He was senior vice president of operations at Homequity, another

PHH Group company. Mr. John J. (Jack) Gottsman has been named president of Homequity. He succeeds Mr Rebert D. Kunisch, who leaves to assume foll-time corporate. responsibilities for all personnel-related services as executive vice president et PHH Group. Mr

chairman of Refco International responsibility for carrying out Mr Paul H. Henson, chairman the Allied-Bendix consolidation, and chief executive officer of the NEWMONT MINING CORP bas eppointed Mr Edward P. Fontaino and Mr Edward P. Richard A. Glesen to its board. Fisher directors, Mr Fontaine Mr Seath is the former chairman will Mr Seath is the former chairman and chief executive officer of will Mr Seath is the former chairman will Mr Seath is the former chairman and chief executive officer of will Mr Seath is the former chairman will Mr Seath is the former chairman chief executive of the board of the seath is the former chairman and chief executive officer of will Mr Seath and
williams companies.

• PPG INDUSTRIES has elected three executives to the newly-created post of group vice-president, with worldwide product line responsibility. Hr William E. Harris has been elected group vice-president, chemicals; Mr Edward J. Stack, group vice-president, glass and fibre glass; and Mr Malcolm G. Slamey, group vice-president, costings and resins. Mr Harris had been vice-president and general manager. president and general manage of the industrial chemical divi sion since 1980. Mr Slack had been vice-president and general manager of the fibre glass divi-sion since 1980. Mr Slaney had been vice-president and general manager of the coatings and resins division since 1977.

 Dr Mickey D. Levy is to join FIDELITY BANK as senior vicepresident and chief economist. Dr Lovy, chief economist with Florida's Southeast Bank, will

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Amor Bank 13 89 200 | 707%, 708% | -0% -0%, 11.75 |
Bk. of Amer. 8 88 XW 150 | 89%, 90%, 0 -0%, 10.75 |
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(nominal value in \$m) Last week..... Previous week 7,330.7 13,301.8 Other bonds Last week.

Previous week 1,215.7

EUROBOND TURNOVER.

‡ Figures not available. No information available— previous day'e price. † Only one market maker

STRAIGHT BONDS: The yield is the yield to redemption of the mid-price, the amount issued is in millions of currency units except for Yen bonds where it is in hillions. Change on week— Change over price a week

earlier —
FLOATING RATE NOTES:
Decomineted in dollars unless
otherwise indicated. Coupon
shown is minimum. C.dte=Date next coupon becomes effective.

Spread=Margin above six-month
effered rate (‡ three-month;

§ above mean rate) for U.S.

dollars. C.cpn=The current
yield.

yield.

CONVERTIBLE BONDS: Denominated in dollars unless otherwise indicated. Chg.day=Change on day. Cnv. date=First date for conversion into shares. Cnv.price=Nominal amount of bond per share expressed in currency of share at conversion rate fixed at issue. Prem=Percentage premium of the current effective price of acquiring shares via the bond over the most recent price of the shares.

The list shows the 200 latest The list shows the 200 latest international bonds for which week were supplied by: Krediet-bank NV: Credit Commercial de France: Credit Lyonnais; Com-merzbank AG; Deutsche Bank AG; Westdeutsche Landesbank Girozentrale, Banque Generale
du Luxembourg SA; Banque
Luternationale Luxembourg;
Kredletbank Luxembourg; Algemene Bank Nederland NV; Pierson, Heldring and Pierson, Credit Suisse/Swiss Credit Bank; Union Bank of Switzerland; Akroyd and Smithers, Bank of Tokyo International, Chase Man-Bank; Credit Commercial de France (Securities) London; Daiwa Europe NV; EBC; First Chicago: Goldman Sachs Inter-national Corporation; Hambros: Bank; IBJ International; Kidder Peabody International; Merrill Lynch; Morgan Stanley Inter-national; Nomura International; Orion Royal Rank Roberts Orion Royal Bank; Robert Fleming and Co.; Samuel Montagu and Co.; Scandinavian Bank; Societe Generale Strauss Turnbull: Sumitomo Finance

Hammerson chief warns on growth setback

our Clork Motal Industr's

BY ALISON HOGAN

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Hammerson Property Investment and Development Corpora-tion which has more than doubled its profits in the last three years, will not sustain the same growth levels in the next three years, according to Mr Sydney Mason, chairman.

"The short-term nutlook for the property investment and development industry is not good," Mr Mason warns share-holders in Hammerson's annual report published sedan Western report published today. He says the underlying economic conditions are 100 uncertain for Hammerson to risk financing many new property investments. At the same time, the com-pany has almost completed the acquisition of minority interests in its existing portfolio so that it can expect no further growth from this source. Last year it increased it participation in the Brent Cross shopping centre from

16 per cent to around 40 per

BOARD MEETINGS FUTURE DATES

The following companies have notified dates of board meetings to the Stock Exchange. Such meatings am usually held for the outpose of rensidering dividends. Official indications am not am interime or finals and the sub-divisions shown below are based mainly on last year's directable. TODAY

Interims—And Cosalt, Pyke. Cosalt, Pyke. Finals—Associated Sritish Foods, Cakabread Robey. Frank G. Gates. Southwest Resources, Toshiba.

cent and benefited from 66 rent its major expansion in Australia reviews.

Mr Mason says Brent Cross is trading well and that substantial premiums have been obtained by the few tenants who have assigned their leases.

The major expansion in Australia to the acquisition of the interests of the Standard Life Assurance company and the Anstralian Mutual Provident Society in several properties. It warms that the "very satisfactory profit"

Hammerson will reduce the extent of its trading operations and hold more proper-

says: "The present unstable economic climate prohibits the processing of many trading ventures rapidly and profitably and demands the application of the strictest criteria before committing things to before committing funds to such projects."

Mr Mason says that although there are some regional varia-tions the picture worldwide is of over-supply of commercial accommodation which must dampen short-term increases in

Hammerson, Britain's second largest property dovelopment Hammersoo's first ever is company has a wide sproad of valuation of fully devel-managed properties and Mr investment properties properties are managed properties are a portfolio worth filling.

Improvement in the market; overall it is trading profitably. Meeting, Hudden-field, June 7, noon.

field, Juns 7, noon.

Britile HillDINGS (heating, air conditioning, lifts)—Results for 1982 reported on Aord 21, 1983. Shareholders' funds £5.1m (£5.54m); Statement E9.7m (£6.72m) including debtors and eropsyments £3.11m (£2.85m) and bank belences and cash £1.95m (£1.76m); current liabilibes £4.95m (£4.05m)—nai current syste £5.10m (£4.05m)—nai current syste £5.10m (£4.05m)—nai current syste £5.10m (£4.05m). Mayting: Cale Royal, Ragent Street, W. May 25, at noon.

May 25, at noon.

CDATES BRDTHERS (printing inko, etintars auggles)—Results for 1862 and current year grospects montact Agril 7. Group sharmholders' funds 657,946 (£54,211). Fixed strate £44,259 (£44,548). Not current sessets £42,964 (£27,899). Decrease in nal borrowings £860,000 (£2,72m incrness). Meeding: Stationom' Hell, Ludgate Hill, EC, June 10, 11,30 am.

in five will probably not be repeated in the company is well placed to explore opportunities which arise Earmerson will probably as economic conditions improve. The U.S. is the brightest spot currencies and Hammerson is opening a second office in Los Anacles.

Hammerson had a good year for net rental locome in 1982 which rose by over 26 per cent to £422m, not likely to be repeated in 1982. Gross profits from property tradiog almost doubled from £121m to £2.34m Development and trading properties are included in the balance sheet at cost. Develop-ment properties have been reduced from £80.35m to £59.79m mainly due to the completion of its huge Bow Valley Square development in Calgary, Canada.

Trading properties are valued at £18.9m, compared with £16.2m. Hammersoo's first ever internal valuation of fully developed investment properties produced

The following securities have been added to the Share Information Service: Greakwater

Yorkgreen Invs. (Industrials).

SHARE STAKES

FT Share

Information

SwFr 10,000.

Separately from the five currency funds, investors may invest in participating shares in the managed fund in which the managers select on a discretionary basis the currency or currencies in which investments are decominated. Those shares will be denominated in U.S. dollars and the minimum initial subscription to the managed fund is \$5,000.

comment

on the heels of the very similar On the needs of the very similar County Bank Currency Fund offering, and is fortuitously timed to beoefit from pre-election sterling nervousness—the initial offer closes just three the initial offer closes just three days before the general election. There is a full range of services available, including a nuney market rate of return (with rolling up of interest) in five currencies, together with casy switching, and with an additional managed fund facility (for which there are extra clusteen). Whauings:-Epicure Holdings together with any of its subs or associates is now interested in which there are extra cliarges). The big money will probably come from corporate treasurers, but with a minimum in sestment of £5,000 (or the equivalent in other currencies) there is certainly room for private investors too.

rentals and values.

Citifunds makes offer

Citifunds, an open ended in Jersey, is offeriog up to 60m Participating Redeemable Preference shares of U.S. 1 cant

Citifunds aims to provide professionally managed invest-ment in the currency or curren-cies of the investors choice yielding a mocey marker rate of returo combined with low risk. Investors will be able 10 invest in any one or more of the following five currencies: Deutschemarks, yen, sterling Swiss frame and U.S. dollar. The minimum. subscription to the currency funds is: U.S.\$5,000, DM 10,000, Y1.25m, £3,000, SwFr 10,000.

fund is \$5,000.

Information Service: Greakwater Resources (Section: Canadians); Merrydown Wine (Beers); American General Corpn. (Insurance); Arcolectric "A" (Electricals); Atlantic Metropolitan (Property); Greenwich Resources (Canadians); Samantha Exploration (Mines); Samson Exploration (Mines); Yorkgreen Invs. (Industrials) The Citifunds launch comes hard

The company also attributes generated from trading ventures **RESULTS AND ACCOUNTS IN BRIEF**

RILEY LEISURE (anooker and keep fit equipmons)—Results for 17 months to the and of December 1982 reported April 9. Shareholdem (unde 27.51m | 12.2m for the 12 months to July 1981); fined easets 25.3m (£1.86m); net current easets £7.2m (£68,000); deceases in net liquid funds £1.47m (£438,000 increase). Meeting: The Connaught Roome, Great Queen St., WC on June 9 at 12.30 om. idlary. Meeting: Liverpool, Juno 9 at 11-30 am.

AQUASCUTUM GROUP (clothing manufacturer and distributor)—Results for open desires. (Agents again been equalified en a going concars in mail liquid funds £1-47m (£438,000 Increase). Meeting: The Connaughit Roome, Great Queen St., WC on June 9 at 12-30 pm.

CAMREX (HOLDINGS) (merine and industrial contings menulacturer)—Results for 1982 reported April 22, 1983. Shareholdern tunde £10.89m (£1.89m): elemeholdern tunde £10.89m (£1.89m): elemeholdern tunde £10.89m (£1.89m): net current easests £2.08m (£1.89m): net decrease in working capital £1.95m (£1.89m): net decrease in working capital £1.95m (£1.89m): net decrease in working capital £1.95m (£1.89m): net current easests £2.08m (£1.89m): net decrease in working capital £1.95m (£1.89m): net decrease in working capital £1.95m (£1.89m): net current easests £2.08m (£1.89m): net decrease in working capital £1.95m (£1.89m): net current easests £2.88m (£1.89m): net current easests £1.88m (£1.89m): net current easests £1.88m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): net current easests £1.89m (£1.89m): fixed easests £1.89m (£1.89m): n

accounts, there is necessarily a degree of uncertainty in assessing the realisability in tull of a loan of £1.28m · regarding a former Canadian aub-aidiary. Meeting: Liverpool, Juno 9 at 11.30 am.

THOMSON T-LINE CARAVANS—
Results for 1982 reported on April 20
1983 9hareholdem' funde [D1.07m]: fixed assets [1.51m (£1.52m]:
increase in working osetts [196.704]
(decrease [£22.67]). The accounts
have spain been qualified en a going
concern basis. Meeting: Falkirk, June
9 st noon.

June 19, 1 em.

CENTRAL AND SHEERWOOD (ongineering, distribution, erinting and eubliablag, financiel services)—Results for
1982, inported May 5, 1983, Groue
fixed essets £15.48m (£15.5m); ner
current essets £19.03m (£18.5em); ner
current essets £19.03m (£18.5em); ner
current funds £24.25m
(£25.81m); working capits! decreased
£0.51m (£3.37m increase), Cheirmen
believes long makem have been eliminetad. If so, he 44ys, the company
can look forward to considerably better
results by the ond of 1983, Meeting:
Hyde Park Hotel, SW, June 8, noon.

J. E. EMGI AND AMD SONE (1985).

J. E. ENGLAND AND SONS (WEL-LIMSTOM)—Results for the year ended January 1, 1983, mported April 9. Group ehereholders' lunds £947,916 (£1,32m). Fixed assets £984,389 (£708,117). Her current sesses £13,182 (£468,251). Decrease in working cepital £258,157 (£88,873 incmess). Masting: Tellord, Juno 9, noon.

228.167 (CSS.873 incmsee). Mesting: Telford, Juno 9, noon,
HGRACE CORY (chemical colour manufecturer).—Results for 1582 reported on April 22. Shereholder? funds 23.11m (23.07m); fixed essets £1.78m (£1.81m); current assets £2.01m (£1.73m), including debroom £36,731 (£880,002) and bank belances and ceeh in hand £119,315 (£38,000); net current assets £1.37m (£1.28 m); increase in working capital £190,529 (£69,848 decrease). Mr S. J. S. Eley will retime a chairman at the annual myting, his successor is Mr John Finches, Mesting: 17, Southempton Piece, WC. Juns 10, at noon,
HOPKINSONS HOLDINO 5 (manufocturer of valvas)—Results for your 10 January 28 1983 reported Agril 30. Group fixed essets £8.91m (£8.84m); current liabilities £16.93m (£15.3m); ahomholdem funds £28.94m (£3.47m); current liabilities £16.93m (£15.3m); ahomholdem funds £28.94m (£3.57m), increase in working; capital confinitements £478.000 (£18,000). Choirman anys trading conditions continue to be difficult, and with erder books romeining at previous levels, the company has the capecity to take advantage of On

EC, June 10, 11.30 am, MEADLAM, SMS & COGGNS (lootwear manufacturer)—Results for year ro January 31, 1983, mported on May 11. Shareholdem' lunds £2.3m (£2.2m); fixed essets £0.672 (£525.585); not corrent essets £1.7m (£1.5im). Decrease in net liquid funds £509.875 (£281.595 increase). Chaimen asys them are eigns of improvement and he is hopeful that them is a better year in prospect, Mosting: Cumballand Note!, Marble Arch, W, June 10, at 11 am,

STATEMENT OF THE CHAIRMAN, Mr. T. S. HOHLER, M.C.

King & Shaxson PLC

to be presented at the Annual General Meeting of the Company on 13th June 1983

A steady fall in interest rates in the six-month period to 31st October 1982 enabled your Board to report record profits at the interim stage. Expectations of further falls were partially fulfilled on 4th November when base rates eased again by 1.4% to 9%. At this point a number of factors, most notably a sharp weakening of world oil prices, led to a sudden and largely unexpected relapse in the level of Sterling. The immediate response, on 26th November was to push interest rates up by 1% and, when this proved insufficient to steady the Pound, by a further 1% on 12th January 1983. Although action had been taken to reduce and shorten our portfolio, some losses were sustained. A measure of confidence has since returned allowing rates to revert to their earlier downward trend. However, market rates have tended to discount falls long before the Bank of England has deemed it prudent to sanction them and, as a consequence, capital profits have been partially eroded by running losses. Nevertheless, the profit for the full year of £1,500,000 after provision for rebate, lax and transfer to Inner Reserve is the highest in your Company's history.

Your Directors propose that a final dividend of 5 pence per share, making a total of 7.5 pence per share, be paid on the Ordinary capital, an increase of 15.4% over 1982. A transfer of £500,000 has been made to General Reserve which now stands at £3,500,000, and Inner Reserves stand at a record level.

The outlook for the current year is as clouded by uncertainty as ever. At the time of writing, there appear to be grounds for modest nptimism but doubts persist on money supply trends both at home and in the United States, the strength of the economic recovery oil price stability and many other factors. If the result of the General Election on 9th June is any other than the return of a Tory Government with a working majority, the implications for Sterling and interest rates are grim.

Copies of the 1983 Annual Report and Accounts may be obtained from The Secretary, King & Shaxson PLC, 52 Cornhul, London EC3V 3PD.

European Banking Company Limited

wish to notify you that new telephone numbers are operating now for their Bond Dealing and Bond Sales departments.

The telephone numbers are:-

Bond Dealers Bond Sales

Banco de la Provincia de Buenos Aires (A public entity organised under the laws of the Republic of the Argentine) U.S.\$50,000,000

Floating Rate Notes due 1988 Redeemable at the Noteholder's option in November, 1986

For the six months

23rd May, 1983 to 23rd November, 1983 In accordance with the provisions of the Note,

notice is here by given that the rate of interest has been fixed at 94 per cent. and that the interest

payable on the relevant interest payment date, 23rd

Agent Banks 2 12

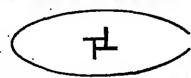
November, 1983 against Coupon No. 4 will be U.S. \$242.78.

Morgan Guaranty Trust Company

01-623 5555 01-623 1122

The address and telex numbers remain the same i.e. 150 Leadenhall Street, London EC3V 4PP Telex: Bond Dealers 8951961, General 8811001

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L. TEXAS PETROLEUM, INC.

(incorporated with limited liability in the State of Texas In the United States of America)

Share Capital at 23rd May 1983

Authorised and proposed to be Authorised

issued and proposed to ba issued

120,000,000

Shares of Common Stock without par value ("Shares") 107,611,301

Application has been made to the Council of The Stock Exchenge in London for the Shares to be admitted to the Officiel List, subject to a proposed Issue by wey of rights (which is expected to become unconditional on 10th June 1983) of 50,611,008 Shares of Common Stock at £0.20 per Share taking place.

Particulars of the Company are available in tha Extal Statistical Service. Attention is drawn to the section at the head of the particulars entitled "Special Condition". Copies of such particulers may be obtained during normal business hours on any weekday (Saturday and public holidays excepted) up to and including 13th July 1983 from:—

Kleinwort, Benson Limited 20 Fenchurch Street London EC3P 3DB

Henderson Crosthwaite & Co. 194/200 Bishopsgate London EC2M 4LL

23rd May 1983

This announcement appears as a matter of record only.



Ente Nazionale per l'Energia Elettrica

SwFr100,000,000 Medium Term Fixed Rate Credit

> Guaranteed by The Republic of Italy

Managed by S. G. Warburg & Co. Ltd.

Funds provided by

Banca Nazionale del Lavoro

London Branch

The Industrial Bank of Japan

(Luxembourg) S.A.

The Bank of Nova Scotia

Channel Islands Limited

Bank of Montreal

IBJ International Limited Westpac Banking Corporation

Agent

Westpac Banking Corporation

15th April, 1983

EQUITIES

Prios	Amount pold up	Rongro.	High	Low	: Stock	Closing	+ er	\$ <u>\$</u>	Covered	Oross Yiotd	Ratio
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FIXED INTEREST STOCKS

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Renunciation date usually last day for dealing tree of stame duty, b Figures based on presectus estimates, d Oluidond mis peld or payable on part of capital; cover based on dividend on full capital. p Assumed duidend and yield, u Forcest dividend; cover based on presidually sept as earnings. Filluldend and yield based on prespectus or other official assimates for 1993-94. O Grose. I Cover silows for conversion of shores not now tanking for dividend or ranking entry for prestricted dividendo. • Figures or recort swarted. § Placing price, p Penca unless otherwise indicated. § Isoued by monder. © Official solid. § Figures or recort swarted. § Placing price, p Penca unless otherwise indicated. § Isoued by monder. © Official solid. § S Relatioduced. ¶ Isoued in connection with reorganisation marger or take-over. If introduction. □ Isoued to former preference holders. ■ Allomant latter in the production. □ Isoued to former preference holders. ■ Allomant latter in the production. • Provisional or parity-poid silotment lottom. ★ With werrents. • Effective issue price silot scrip. § Formerly dept in under special rule.

PENDING DIVIDENDS

Dales when some of the more important company dividend statements may be expected in the next few weeks are given in the following table. The dales shown are those of last year's announcements except where the forthcoming board meetings (indicated thus?) have been officially notified. Dividends to be declared will not necessarily be at the amounts in the column headed "Announcement last year."

"Announcement las	t year."		
, made and other and	Announce-		Announce-
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55.5	Year		year
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This advertisement is issued in compliance with the requirements of the Council of The Stock Exchange. It does not constitute an invitation te subscribe for ur purchase any securities.

Rightwise plc (Registered in England-No. 1331703)

Issue of op to £680,000 of 12 per cent. Loan Stock 1983 1985

This advertisement appears in connection with the issue of up to £680,000 nominal of 12 per cent. Loan Stock 1983/1985 ["New Loan Stock") pursuant to an offer by Rightwise plc to acquire all the share capital of The Surmah Valley Tea P.L.C. The New Loan Stock has been admitted to the Official List by the Council of The Stock Exchange.

Particulars relating to the New Loan Stock are available in the Extel Statistical Services and may be obtained during normal business hours on any weekday (excluding Saturdays and public holidays) up to and including 3rd June, 1983 from:

N. M. Rothschild & Sons Limited, New Court. St. Swithin's Lane. London EC4P 4DU

James Capel & Co., Winchester House. 100 Old Broad Street, London EC2N IBO

A copy of this Prospectus and of the Application Form, having attached thereso the documents specified below, have been delivered to the Registrar of Companies in London for registration. CHANNEL ISLANDS TRANSATLANTIC INVESTMENT FUNDS LIMITED A company or 20th April, 1983 under the provisions of the Companies (Jersey) Levis 1861 to 1968.

CITIFUNDS

MANAGED BY CITIBANK (CHANNEL ISLANDS) LIMITED

Initial offer for subscription of up to 60,000,000 Participating Redeemable Preference Shares of U.S.1 cent each ("Participating Shares") of the following classes and at the prices respectively specified, payable in full on application:—

CLASS	PRICE PER PARTICIPATING SHARE		SHARE CAPITAL	·
Deutschemark Shares Japanese Yen Shares Sterling Shares Swiss Franc Shares United States Dollar Shares Managed Shares	DM 20 Y 2000 £ 5 SwFr 20 U.S.\$10 U.S.\$10	Authorised U.S.\$ 100 600,000	in Founders Shares of U.S.\$1 each in Unclassified Shares of U.S. 1 cent each	Issued and to be issued fully paid U.S.S 100 up to 600,000

The Subscription lists for this initial offer of Participating Shares will open at 9.00 a.m. (Jersey time) on Monday, 6th June, 1983 and will close at 10.00 a.m. (Jersey time) the same day.

bir Alfred Beni Managing Director of Citibank (Channel Islands) Limited, Jersey, Channel Islands. John Chester Bott

Ronald David Corwin, Managing Director of Familtank S.A., Brussels, Belgium

Friedrich Wilhelm Menzel, Managing Director of Cribank A.G., Frankfurt-am-Main, Federal Republic of Germany. Francesco Redi. Senior Vice President of Ctubank, N.A. Paris, France. Adolph John Zubick, Semor Vice President of Ciribank, N.A., London, England,

ill clo P.O. Box 104, St. Helist, Jersey, Channel Islands. Registered Offices Channel House, Green Street, St. Halier, Jersey, Channel Islands. Managers, Registrars and Secretary: Calbank (Channel Islands) Lumbed, Channel House, Green Street, St. Helier, Jersey, Channel Islands.

Investment Advisers: Citibank, N.A., London branch, 336 Strand, London WC2R 1HB. Bankers and Castodism: Tribank, N.A., Jersey branch, Channel House, Green Street, R. Helier, Jersey, Channel Islands.

Auditors: Peal Marwick, Mitchell & Co., Chartered Accountants, Equity & Law House, La Motte Street, St Heller, Jersey, Channel Islands. Stockbrokers: W. Greenwell & Co., Bow Belb. Husse, Bread Street, London EC4M 9EL.

Legal Advisers: In Jersey: Bedell & Cristin, Normandy House, St. Helier, Jersey, Channel Islands. In England: Coward Chance, Royer House, Aldermanbury Square London EC2V 7LD. CITIFUNDS:

The Company is an open-ended investment company incorporated in Jersey and by this Prospectus is offering up to 60,000,000 Participating Redeemable Preference Shares of U.S. 1 cent each, which will be issued in registered form. Application has been made for the Participating Shares of each class to be admitted to listing on The Stock Exchange in London. Currency Funds:

Investors will be able to invest in any one or more of the following five currencies:

Deutschemark -Japanese Yen Sterling -Swiss Franc

United States Dollar Each currency will have its own Currency Fund and an investment in the Currency Fund selected by the investor will take the form of an investment in Participating Shares of the class related to that Currency Fund. Each Currency Fund is to be managed entirely separately and independently from every other Currency Fund. The minimum subscription to the Currency Funds is:-

U.S.\$5,000 DM 10,000 £3,000 Y1,250,000 . SwFr 10,000

Separately from the five Currency Funds, investors may invest in Participating Shares in the Managed Fund in which the Managers select on a discretionary basis the currency or currencies in which investments are denominated. Investors should be aware that the value of the Participating Shares in the Managed Fuod may fall as well as rise.

Participating Shares of the Managed Fund will be denominated in U.S.

SUMMARY

This summary is qualified in its entirety by the fuller particulars set out below to which reference should be made. application to the Custodian. Telephone Jersey (0534) 70334 and Telex dollars. The minimum initial subscription in the Managed Fund is U.S.\$5,000.

> CTTIFUNDS will provide a professionally managed investment in the currency or currencies of the investor's choice, yielding a money market rate of return combined with low risk, ready availability of funds and the ability to switch between each Fund. Investment Policy:

> Each Fund will be managed within prudeotial and conservative guidelines as to the Equidity and quality of the investments held. Investments of the Currency Funds will be made and maintained so as to avoid foreign exchange risk.

Allotment and Redemption of Shares:
Participating Shares may be applied for oo any Dealing Day and, subject to two days' prior notice, may be redeemed on any Dealing Day Settlement will normally take place two business days after the relevant Dealing Day.

Conversion of Shares: Sharebolders can elect to switch all or part of their investment in one Fund to an investment in another Fund by converting their bolding of Participating Shares of one class into Participating Shares of another class. Special Arrangements:

Investors, particularly those with substantial funds at disposal, may prefer to take advantage of a simplified procedure under which they elect to have their Participating Shares registered in the name of the Custodian, who will on their behalf hold the share certificate(s) and execute the investor's telexed instructions as to conversion and/or redemption. The required procedure on subscription is set out in Application Procedure below. Arrangements as to cooversion and redemption can be obtained by direct

Participating Shares have a nominal value of U.S. 1 cent each. Following this initialissue, which is at the subscription prices specified above, each class of Participating Shares will be valued by reference to the underlying net asset value of the relevant Fund. In normal circumstances, the subscription and redemption prices of Participating Shares of a Fund on any Dealing Day will be the same.

No dividends will be payable on the Participating Shares. All incomwill be accumulated in the appropriate Fund and share prices will be calculated to reflect each day's accrued income.

The share prices for each Fund will be published daily in the London dition of the Financial Times and can be obtained during business hours by reference to the Managers.

No charges will be made by the Company to an investor on subscription for, or redemption of, or conversion into Participating Shares in the Currency Funds. Subscriptions for or conversions into Participating Shares in the Managed Fund of less than U.S. \$10,000 will be subject to an initial charge of 21/2% of the amount invested.

The Managers and the Custodian will receive monthly for their services to the Currency Funds a fee at the rate of % per cent. per annum and 'h per cent. per annum respectively calculated on the average daily net asset value of each Currency Fund.

The Managers and the Custodian will receive monthly for their services to the Managed Fund a fee at the rate of 114 per cent. per annum and 1/4 per cent. per annum respectively calculated on the average daily ne asset value of the Managed Fuod

No person receiving in any territory (other than the United Kingdoos) a copy of this Prospectus and/or Application Form may treat the same as constituting or the new should be in any event use such Application Form unless or the relevant servinory such an invitation or offer could lawfully be made to him without compliance with any region of other legal requirements. It is the responsibility of any person outside the United Kingdoos) a copy of this Prospectus and the payment of any government or other consents which may be required, the satisfaction of a full observance of the laws of the relevant territory in connection therewish, including the obtaining of any government or other consents which may be required, the satisfaction of a full observance of the laws of the relevant territory in connection therewish, including the obtaining of any government or other consents which may be required, the satisfaction of a full observance of the laws of the relevant territory in connection therewish, including the obtaining of any government or other consents which may be required, the satisfaction of a full observance of the laws of the relevant territory in connection therewish, including the obtaining of any government or other consents which may be required, the satisfaction of a full observance of the laws of the relevant territory in connection therewish.

Prospective shareholders should be aware that the Participating Shares do not represent a direct obligation of Chicorp, of Citibank, N. A. or of their respective branches or subsidiaries. The consent of the Finance and Economics Committee when no responsibility for the financial soundness of any schemes or for the correctness of any of statements made or opinions expressed with regard to them.

All references herein to: (i) "E" are to the currency of the United Kingdom; (ii) "U.S.5" and "U.S. Dollars" and "U.S. cents" are to the currency of Japan; (iv) "SwFr," and "Swiss Franc" are to the currency of Japan; (iv) "DM" and "Deutschemark" are to the currency of the Federal Republic of Germans. "Dealing Day" means any day that is a business day in Jersey: "Scalement Day" means the Garrency Funds and the Managed Fund,

For all purposes of this Prospectus, a business day in Jersey shall be decimed to run from 10.00 a.m. (Jersey time) on the one business day until 10.00 a.m. (Jersey time) on the immediately succeeding business day.

CTTIFUNDS

The Company was incorporated in Jersey in 27th April, 1964 with lamited faithfur to an open-embel movement company. It has at antiportized sharts capital of U.S.59th [01] doubted into pin Foundair shares inf U.S.51 cack such of United the Company of the Company will be used to U.S.51 cack such of United United The Company will be used to Company to State (Company and to Company will be used to Company to State (Company) and to Company will be used to Company to Company (Company). The Company of the Com

on an Dealing Day.

Each Fond will be maintained by the Company of a separate and identifiable base from every inher Fund. Involved select the corticity in which they wish to one of and trively by subscribing for Participating States of the relevant class linescontrains which all or part of their subscribing to Barriery States of the relevant class linescontrains which all or part of their subscribing to Barriery of the refer to their holding of Participating Shares of one class indeed participating Shares of the rober class in Involves may subscribe, ownered and reducin Participating Shares of the rober class in Involves may subscribe, ownered and reducin Participating Shares on any Dealing Day. The Directors have power under the Company's containance in introduce Currency Funds demonstrated in other currency.

other curreness. September five Cerrency Funds, investors may invest in Participating. Shares is a Managed Fund in which the Managed solicit on a dearest-may busine the currency or currences in which investments are denominated. Participating Shares of the Managed Fand will be demonstrated in U.S. dollars but will compress a superactic elseviol of share from the Participating Shares of the United States Dollar Currency Fund. MANAGERS, REGISTRARS AND SECRETARY

MANAGERS, REGISTRARS AND SECRETARY
Curbank (Channel blanch) Limited in incorporated and resident in Jersey
and will be responsible for implementing the investment policy of the Computer,
as had down by the Board of Directors, as well as being responsible for the
administration of the Currency Funds and the Managed Fund. It will are as
Register and Secretary to the Computer
PAYESTARDARY ASSESSED.

PAYESTARENT ADVISORS

(10fbank, N.A., through its London branch, will act as the investment advance for the Managers as investment advance. Citibank, N.A. will make recommendations to the Managers up in investment and keep three investments under regular invest. Citibank, N.A. has found in evens of U.S.FF billion strict discretionary management by its sheats workloade. CUSTOPIAS Cuthard, N.A., through its Jersey branch, will set as the custodate of the investments held for each Fund and will there two be responsible for the custody of all the assets of the Funds. Crobank, N.A. will also act as bankers to the Company.

CTICORP

Cateory is a hunk holding company, incorporated in the U.S.A. Through its hunking and inher subsolutions is aftern a broad range of banking and related immental services weighbode. As at 31st December, 1996, Cincorp's crossibilated in income his the sear was U.S.F.22 infliction and consolidated assets were U.S.F.00 billion, making it one of the largest banking and financial orbitations were U.S.F.00 billion, making it one of the largest banking and financial orbitations were to sea subsolution in the making largest comments at banks with inflices in 96 assumings.

Citabank (Channel Hambel Limited as which), assumed subsidiary of Citabank, N.A., and was one of the first num-U.K. banks to be established in Juries.

N.A., and working to COMPACT A section of the
The objectives of CTI FFE TELLY ADD.

(a) In primate such Currency band with a money mail let rate of return common with the primate such Currency band with a money within a Currency Fund demonstrate in the televant currency and, through the paying of their holdings of a subject currency, in orivest in larger amounts to their mutual advantage with returning read a substitute of funds.

(c) In exhibit insulates to move their interstments treely and easily between the currences comprising the Currency Funds, and

(d) with regard to the Managed Fund, in seek to maximize growth by selecting extractions demonstrated in those currences they believe will provide the highest ratures, taking into account exhaunge rates as will as maximize trates.

INVENTMENT POLICY

The principal categories of investment of each Fund will connect of bank deposits, cartificates of deposit, bonds, moto, and other formacial polyments, including short-term debt obligations of Gavernments. Givernments and Livid Concernment bodies in the relevant demosite and Euro-currency markets flowstment will not promisely be made in instruments having a mategory exceeding 12 months.

exceeding 12 months.

The awards representing the investments of each Fund will be invested within prodemal and conservative guidelines laid divisit by the Hoard of Directors as to the laguality and quality of the financial instruments. A minimum of 70 per vent of the value of each Fund will have made to encourage within two dates and a monimum of 50 per vent in the value of each Fund will normally be transmissed in investments marked instruction which in estimate on the transmissed in the value of each Fund will normally be transmissed in the transmissed in the transmissed in the transmissed in the transmission behalf of any Fund in any section of continuent of any one manufaction make now owered ill per cain til the grows awards of the Fund of the time the investment parameter.

not exceed ill per extin all the grow assets of the Fund at the time the investment is made.

Within each Construct Fund, the Company will ordinarily acquired investments denominated and payable in that entrance, though the Company may purchase trivestments denominated in a different currency probabled is loreared currency sale of the principal inmaint in the investment plate the expectal interest in anatomy) is effected. The Company will accordingly ensure that no currency role a mace within each Currency Fund. All macing is accumulated in the appropriate Currency Fund and share price will be calculated to reflect each day's accured anome. Under normal creativations, therefore, the value of each Currency Fund and share principal categories of investment and souliar investments and will have the same principal categories of investment and souliar investments and each continuing investment decided in increase.

The Managed Fund of these the Currency Funds though the Managers will make continuing investment and the Currency Funds in which the Managers will make continuing investment and the currences of investment, the instruments in which the westments are held and the proportions in which they are to be maintained finestimes should be aware that the value of the Participating Shates in the blanged Fund any fall as well as true.

STITAL OFFER

INITIAL OFFER
The Participating States of each class are offered for subscription by this Productive at the following process and at the following minimum subscription amounts.

Class
Districtions of Price per State Minimum Subscription
Districtions of Price per State Minimum Subscription
Distriction States DM 21
Japanese Ven Shares PM 201
Statement Shares PM 201
Subscription Shares PM 201
Subscription Subscription
United States Dollar Shares
Managed Shares U.S 510
U.S 510
U.S 510

Managed Salares.

The Subscription Lists for this immal offer of Participating Shares will open in 9.00 a.m. (Jetsey tritle) on this June, 1983 and will close as 10.00 n.m. (Jetsey tritle) on the June, 1983 and will close as 10.00 n.m. (Jetsey time) the same day. Application modes, received prove to the June, 1983 will be placed upon depress and any interest arrang will be retained for the benefit of the Company. This Prospectus does not constitute an order of any Participating Shares of the Company after 10.100 an. (Jessey time) as 6th June, 1983.

Sames of the Company after (0.10 a m. (Jerse) time) no 6th June, 1983.

SAMES OF THE JUNE, 1983, inventors man on any Dealing Day apply on the terms of the then available Prospectus and Application Form for Participating Sharm of a Correst's Fluid or of the Managed Fund at a price which will be calculated by reference to the Manager's projection of the field as of the Settlement Day.

The subscription price will be applied to all applications received between 10s in (Jersey time) that bosiness day and 10 a m. (Jamey time) the immediately succeeding business day A price per share will be quoted for each Fund and the published daily so the London educated the Fund. Fund of the principle of the subscription of the Financial Times. The price can be obtained during business hours by reforence to the Managers.

the phoneura state is the beautiful the control of the Mattagerts.

APPLICATION AND ALLIOTMENT

Applications for Participating Shares pursuant to this Prospecies must be made as an Application Form or by way of tries at the prescribed form. An Application Form is set out below together with the prescribed form of telex application. A telex application has nevertheless to be confirmed in writing. Full details of the Application Procedure and payment as set out below.

In order to comply with Japanese Massivery of Fisture requirements, the subscription and redemption muscy of the Japanese Yes class of Participating Shares classed to paid in Yes. Payment may be made in any of the other currents to specified above and, on receipt of classed funds, the Managers will effect the necessary foreign exchange transaction on behalf of the investor. The investments

held in the Japanese Yen Currency Fund will, however, at all justes be maintained in, of by reference to, Yen.

The Company excitors the right to report any application in whole or in part, in which force will be Applications Fund and submerspaces encodes will be returned by post at the applicant's risk. Fractions of Participating Shares will be abouted. Used the Company is statisfied that (seemed funds have been or will be included on the reference between the following Shares will be attack to the Index and application.

A contract space will be assetted to application to right abouted in the reachest of Participating Shares of the Participating Shares of the reference to the Index of the total contract space will be asset to a select of the Participating Shares of the reference of the second from white the posterior of the research of the second from the witten continuation of us terms) and cleaned funds in respect of the subscription mones.

REDENPYTONS

Commission of the legal and the second secon

written's telecam-ince of tysicompisous specifying the temples of a Participating Starres in he redecented and the Found is which they relate had, soften that number of days, the telecant share correctants! I largether with the formul with that number of days, the telecant share correctants! I largether with the formul states of redestpoon set out on its reverse days, completed and signeds, lating which to decaption will take place two days after receipt by the Managers of the telecant share certificate(s) with the formul source of redempoint art out on in reverse days completed and spend.

Notices of redempatin received after 10 a.m. (Jersey due) on any Dealing, Day will be decined in a larget of the telecant share redempating received on the immediately according Dealing Day.

The redempating price on any Dealing Day will be askenting by reference in the blanegers' projection of the not asset value of the relevant Fund as of the Settlement Day. (Index mirmal circumstations, the redempating price and the subscription of price in any correct price will be the same.

Per ment of the redempating price will introduce with Eurot-market, practice by the redempating beautiful days after the redempa. Dealing Day in accordance with Eurot-market, practice by the redempating price will introduce on any theory after the redempa. (In the last the redempating price will introduce on any third previous business days after the redempa. (Dealing Day in accordance with Eurot-market, practice by the redempating blancholder's requestion with the redempating blancholder's restrictions by shouse or at the shareholder's requestion with the redempating blancholder's restrictions to the redempine planet of the redempine blancholder's reduce.

The share corrolation representating the hadron of any holding of manaded redement. The share corrolation with the reference of any lattice of any three for the service of the redempined bank account.

Day or accordance with operational received and in the shareholder's risk.

CONVERCENCY.

Participating Shareholders may on any Dealing Day owitch all or part of their investment or any Forth into an investment in another. Fund by converting all or part of their investment or any Forth into an investment in another. Fund by converting all other forther in Participating Shares of the other forther into the part of the other forther into the part of the other forther into the part of the other forther into the forther into or teles notice of convertion in the Managers specifying the number of Participating Shares to be converted. The Fund to which they relate and the Funday into which onverteen in to take place. The extended share continuately to the participating shares to the convertee with the converteence indice set not in to reverse having been spond and duly completed, though converting with recent the rest state certaintale land are new share certaintee representing the balance of any holding in the original Found will be passed showly therefore in accordance with instructions recent and and at the converting sharesholder risk.

The Managers will rilest such convertion by redoming the secretary number of Participating Shares of the risk of the Appropriating Participating Shares of the requiring proceeds at subscription of Fundamental Shares of the relevant Fundamental accordance with the formula and applying the resulting rescreed at subscription of Fundamental Shares of the relevant Fundamental accordance with the formula accordance with the source of the Participating Shares of the relevant Fundamental accordance with the state of the Participating Shares of the relevant Fundamental accordance with the formula accordance with the source of the Participation of the Approximation
implement outversions.

SPECIAL ARRANGEMENTS

(increase, particularly there with substantial family at disposal, may prefer to
take advantate of a simplemed procedure under which they elect to have their
Particularing States reprotected in the name of the Cuendrus, who will on their
Perticularing States reprotected in the name of the Cuendrus, who will on their
Perticularity of the state entitled in and execute the arrestor's telesced materiations
to to other-room addition redeempoint. The required procedure to substriction
to the other-room and redeempoint The required procedure to substriction
to the other-room and preference of the other application to the Custodian: Telephanic
levely (1634) 70334 and Televal/Ca30.

Ferrey 116.34 Jill33 and Televa 182.36.

FEEN

The Managers will receive for their services from each Currency Fund a lent each month at the rate of a per cett, per atmost saleulated on the average darly not above to a long of that Currency Fund a lent that month The Custombus will receive level by the services from each Currency Fund a level each mouth at the rate of by per cent, per atmost calculated on the attempt darly not asset value of that Currency Fund to their month.

The Managers and the Custombus will receive for their services from the Managerd band a level each mouth as the rate of 15 per 1 surf. per atmost mall so per cent per atmost media level of calculated on the average daily not asset value of the Managerd Fund for that ments.

These level can only be increased with the agreement of Paristipating Starcholders in general meeting.

Shareholders can only be increased with the agreement of Participating Shareholders in general meeting.

The lin extinent Advisers will recover by their services from the Managers a fee each mental at the rate of 1 per cent, per arround calculated on the average dails not avert value of each Curtency Fund for that month and a fee each woods at the one of 17 per cent, per arround calculated on the average daily not asset of the Managed Fund for that month. the stranged rate for that month,

CHARGES

No charges will be made by the Company to an investor ret subscription for, redemption of, or conversant into Participating Shares in Currency Fands.

Any hank charges aroung from the payment of months between the Company and an investor will be for the investor's account. Subscriptions for or commences into Participating Shares in the Managed Fond of less than U.S. Str. (2011 will be subject to an install charge of 212 per control the atmosping.)

O.S. SHADOW HIT IS SUPPORTED AN INSULA CHARGE OF 25°P per Centr of the Subsection invested EXPENSES.

The Company will require the all out-of-pocket expenses of the Managers and the Councian properly incarred in the performance of their respective distres. The Company is responsible for as own expenses, including legal and made ices, expenses of its Directors and bank charges.

COMMENCION

The Managers may pay at their own discretions a commission at the rate of the per cent per animals to recognize digest structuring mestions to the Correcty Funds andars to the Managed Fund and a commission of up to the per cent, per animals to irrections of U.S. SCRUMTO or more for correctly equivalent). Such commissions will be home by the Managers and not by the Company, will be possible monthly and will normally be on the neutrage daily value of the Participating Shares of each class also eached through the agent or, with each moy be, int the metacy at four.

TARATION

TARATION

The Company

The Company

The Company's hability to tax to Jersey is limited to Jersey corporation tax, carrierily 1200 per annum. The Directors intend to manufer the Company to that it should not become usedent in the United Kingdom. The Company to that it should not some any tax to those constitution in the United Kingdom. The Company about of myon any tax to those constitution is home currentess the Funds are designated. Participating Shareholders are not subject to any denth duffer, capital gasts, piff, wheretience, capital transfer or income tunes in Jersey. No shamp duty is levined for Jersey in the transfer, redemption or conversion of Participating Shares. The attention of Jersey income to drawn at the provisions of Article 134 A or the Indoor Las (Jersey) Law, [96] which may in certain circumstances tender such a realient beble to income tax on the undatarbuted income or profits of their bushs.

tender sich a resident bette an income uncur un une mannen and eine verof their bunds.

United Kingdom shareholders should note that character has been obtained
from the Bourd of Infand Revenue under Section 404 of the Income and
Corporation Taxes Act 1970 that the provisions of Section 460 of that Act will not
apply to the name, conversion or redemption of shares in the Compaint For United
Kingdom tax purposes, the protectal arising from the redemption of shares do out
constitute income unless the recupient is regarded as trading it securities, but any

Chargeable games.

The Company is advised by Tax Coursed that conversion of Participating. Shares of one class into Participating Shares of another class by a charcholder resolute or ordinarity resolute in the United Engelom should not of shell constitute a disposal for the purposes of United Engelom should not of shell constitute a disposal for the purposes of United Engelom should be about a first than the should not of the purposes.

resident or orderately resident in the United Kingdom should not of shelf torthities a shopping for the perspose of United Kingdom should start chargeable gains.

The attention of individuals ordinarily resident in the United Kingdom is drawn to the provisions of Section 478 of the Innovae and Corporations I sees Act. 1970, as amended by Section 46 of the Faustice Act 1981 and to Section 45 of the Faustice Act 1981. These Sections tentain pero hieras for pretening the atomicing of income in why individuals through transactions not other the transfer of about which result describes a resident of domiciled about and may be decreased in the person individual groupeases resident or domiciled about and profits accross to construct and profits of the Company.

Prospective reviewers who are uncertain as to their test or exclusing toution.

ACCOUNTS
The Company's fewarded year code on With April meach year. The Constant will control of a new consum and business where we stationary accounts will consist of a necessia account and balance sheet expressed in U.S. Dellars. For the convenience of Participating Shreebolders, recessed accounts and halmac sheets will be produced an respect of each Fond in the currency of that Fund.

MEETINGS
The annual general meeting of the Company will be held in Jersey. The notice carnening the annual general meeting will be forwarded to standard toport and accounts of the Company.

A other NYSY'S

together with the around report and accordance of the Company.

APPENDIX

GENERAL PFORMATION

Expressions used before here the measure ascribed to them in the Arackes of Association of the Company.

J. Constituting and Share Coptant.

The Company was allowed by the Companies Uersey Laws. Divi to treet with an arithment state of pure control of the Companies Uersey Laws. Divi to treet with an arithment state of pure and of U. Sale, the deviated into 100 Founders States in U. Sale each and of Johnson Unclassical States of U. Sale each and of Johnson in Practicipating States in a Normanial Shares. The Companian of the Company is defined in the Measorandom and Arricles of Associations. The Companions of the Company is defined in the Measorandom and Arricles of Associations. The Associations. The Association of the Company is defined in the Measorandom and Arricles of Associations. The Company is all the control of the Company is defined in the Measorandom and Arricles of Association.

I see Combitation of the Computery is defined in its Memocrandum and Articles of Association. The Articles of Association may be altered by Special Resolution.

2. Share rights:

Founders Shares: Founders bhares may only be issued at pur value and will be led to use behalf of the Managers of the Computer. On a winding up of reportment of capital, the Founders Shares rate for reportment of the normal amount paid up to the Participating Shares that the Normal Shares. Finders of Founders Shares are entitled to record notices of cienceal Meetings and to use and even behalf founders. Shares are entitled to record notices of cienceal Meetings and to use thereof. On a poil, a holder is entitled to the value by the Founders Shares will be the shares are the property of the control of

the rany in respect to the reasonal states into a required states up in receiving a replir in any in idental.

Variation of Righter:

1 The lights attached to any class of where (unless otherwise provided by the structure) to be a control to the place of that class) may, whether or not the Comptany is being a country, be a varied with the extracts an writing of the holders of these fraction of the massed where of that close or with the songering of the notes of the holders of the class by a majority of three-fraction or what the sangering of the class of the wholes of the class of th

otherwise expressly province my use terms or have or use maners or use comes of the chemical cost in the varied by the creation or uses of further above by the chemical cost of the chemical cost of the cost of

the same rigid is the sacet from which is said certified and, in each revisionion of an investment, the increase or disministors in value shall be spirited so the rocks and Fund.

In the case of any asserts of the Company (not bring attributable to the Founders States or Negatinal States) which is not considered attributable to a particular Fund or Funds, the Universe. Will have describent, subject in the approval of the Auditors, to determine the basis upon which any such assert shall be allocated between Funds and to vary such less provided that the approval of the Auditors, to determine the basis upon which any such assert shall be affected between Funds and to vary such less provided that the approval of the Auditors, to determine the basis upon which any such as though for the purpose of computing subscription protes) of the class of Participating Shares to which they relate:

When the asserts of the Company attributable to the Founders Shares or the Nomitual Shares provides the Company attributable to the Founders Shares or the Nomitual Shares provides at though for the purpose of computing subscription proves) of the class of Participating such nor profits between all the Founders provided they notice;

the Directors shall have discribed by the Directors shall allocate assets to exceed the provides of the Auditors as a unequent re-allocation thereof in the directors and the found any vary such less from time to time, provided that the approval of the Auditors is unequent re-allocation thereof it is creamistance to be miss from the Funds of the auditors as the unequent re-allocation thereof it is creamistance to a finish the free for the purpose of the chart of provided that the approval of the Auditors is all much required in any case where a lubidity so like creation of the provided of the Auditors, the Directors opining advantages particular for the purpose of the charton of principating States to which they relate;

subject to the approval of the Auditors, the Directors ship in the books of the Compan (1)

heen borne under paragraph (f) above, of in any similar circumstance. There is no Fund for the Norman Shares although in the books of the Company the assets of the Company the assets of the Company the assets of the Company the starbulated whereho will descept as provided of paragraph (e) above) be keys separately from the Funds for the Paragraphing States.

in paragraph (e) more yet algo separately grow the e mans to the ratherpating Sharts.

5, Name Prices:

The subscription and realempto in prices of such class of the table of the particular by reference to the Managet's projection of the value of the particular braid's not exceed the following the particular braid's not the service of the service of exclusions and produced may U.S. dollars will be produced may U.S. dollars will be produced may U.S. dollars will be produced into U.S. dollars will be produced into U.S. dollars will be produced into U.S. dollars will be produced in the third decignal place in the relevant corpusation will be expressed in the third decignal place in the relevant corpusation of the introduced that, in moral decompanages, the surface may be suffered to make the expression of the parameter of the parameter of the subscription price of Parameters for the subscription price of Parameters of the subscription price of the subscription in that I became the procusers of the control of the parameter of the three of that there is the foreign the price of Parameters Doy; the residence of that there is the foreign of price of Parameters Doy; the residence of the three of the relevance of the produced of the subscription of the processors for colories for estimation to produce the estimation of the Parameters of these meaning themselved.

prematurely, any pensities or lives incurred may be relicated in the redemption price of the Paracopaling Shares conserved.

On any habscriptor Day, the Managers (as principals) may at their tole discretion satisfy in while or an part any application but the swate is relicenpaint of perfectioning Shares of any class in setting such shares to a fractioning such states from the population price and shares are final price respectively. In this Principation of a shareholder at the relevant advantagement price or relicingitud price respectively. In this Principation, references are make to redemptions and cronscription bank or a barried sentence to Day. These are in last subject to final-sometiment on a particular bentherior Day and, in the case of leading process, the Shareholder remains a shoreholder region and, in the case of the original right until such Sentence in Day.

6. Conservation:

The response that ages yet content but,

Farticipating Shares of any class may be converted on and Dealing Day intoParticipating Shares of any class may be converted on and Dealing Day intoThe remainer of Participating Shares of the generalizing from conversion
shall be determined by the Directors in accalabate (or as nearly as may be in
accordance) with the fedural right burnets.

NSH a USIII & RP & CCR
whote:

NSH is the mainley of Participating Shares in the new class to be allowed:

where:

Not is the number of Participating Shares of the new data to be allocated;
Ooth is the appreciate number of Participating Shares of the original class to be converted comprised in the Commercian Notice;
RF is the Redemption of Price per share of the original class ruting on the relevant Desting Day for perticipation of the discrimined by the Discriminant on the relevant Desting Day as representing the Curricus; Conversion Rotte applicable to the transfer of assets between the ruting a funds; and P is the Subscription Price per share by the new richs ruting on the relevant Desting Day is territories of the context of the price of the context of the co

Design Day to terrhement on the relevant Day.

Temporary Suppension of Valuntismus:
The Objection may declare a stopension of the determination on any Dealing Day of the test such violent may be therefore may be used to the relevant bettlement Day of toy leand for the whole or any parts of a period during which there is a clerater of, or the suspension of, puding on any mories on which it the opinion of the Directions a substantial, part of the for-estimental comprised in such faind is traded or a twofaction to contract many of the for-estimental comprised in such faind is traded or a twofaction to contract of the for-estiment comprised in such faind to the for-estimental purity of the Direction of the substantial purity of the printing of the Direction) of the Direction as assertioning fits value of the substantial purity for the opinion of the Direction) of the Direction and estimated in such Faind cannot reasonable be secretarized.

The none, redemption and districted in 4 Participating Shares of any class may be suspended Josing any period when calendaries in respect of the relevant Faind are suspended. Notice of the imposition in this participating shares in that class may which are the participating the Tangaras in the class may which are when the foreign the transportation of the relevant from the participating the recognity the terminations of the substance in the considered on the last Dealing Day following the litting of a suspension.

Computation Redemption of Participating Shares:

Office autifulty we, requests for reademption will be considered on the less Denising Day bollowing the litting of a stap-praise.

8. Comparison: He aggle pain et a sort value of all the Furds maintained to the Company half of a Denistry Day be less than low weeks motive of the decomposite and it at Denistry Day be less than low weeks motive or all biolities of Participating Shares, redeem on the Denistry Day prominated in such a stock at the respective telectropism encounter the Denistry Day prominated in such a stock at the respective telectropism encounter that they have enterent Days all float not somet of the telectropism. Shares not preventedly redeemed.

8. It is any time, the net asset value of any Fund maintained by the Company stad on a Dealing Day be less than the capturated by Participating Shares of the inventional professor of the inventional professor and the state of the participating Day professor at the content of the participating Day and professor of the inventional professor decomposity of the content of the participating Shares of that class not preventedly redeemed thought without projective to the replace of the before a state of the building Shares of the content of the content of the state of the building Shares of the content of the state of the building Shares of the state of the state of the content of the content of the content of the state of the state of the content of the content of the state of the state of the content of the state of the state of the state of the content of the state of the s

on such day for settlement on the relovant Settlement Days.

9. Borrowinger

The Directors may exercise all the powers of the Company to borrow and the Sector such two courses and the settlement of the Company of the Company and the substitutes to as to proceed that the aggregate amount for the time feeting fearthwave of strategic per two company and its substitutions for the mole being fearthwave of strategic per borrowings) shall not us any time including the previous sanction of a resolution of the Company, in general streeting exceed an amount ciqual to view quarter of the amount by which the nexts exceed the hardwave of the Company. Fix the purposes of the sold limit, the twent of debentures shall be deemed in orderation for remaining notwiths and the state of the contract of the formation for the shall be after mornal circumstances, these powers well only be exercised on a short-term batts.

principion of—

(a) the Article, man Preference Share, which are, or at the option of the Company are to be helve, to be redecimal;

(b) Article 6 of this Law, convert the whole, or any particular class, of its Preference Shares into Redeemable Preference Shares.

Provided thet:

Preference Shares and Redeemable Preference Shares.

Provided the:

(n) on such shares shall be redeemed eitherwise them out of:

(ii) the product of the Company which would otherwise be available for the velocity, or

(a) the processes of a fresh page of shares made for the purposes of the redeemator.

(b) an such shares shall be redeemed unless they are fully paid;

(r) the premains, if any, payable on redemption astas beve been provided for;

(r) out of the profite, or

(n) out of any share premium accounts,

of the Company betwee the shares are redeemed.

(d) where any such shares are redeemed of the order of the proceeds of a fresh noise or where any such shares are redeemed.

(d) where any such shares are redeemed out of profits which would other wise have been a values all the raisefund to a Reterior fund to be called the "Oppata Rodemytion Reserve Fund to be called the obsites redeemed, and the provisions of Article 1 of this Law relating to the reduction of share appeal of a Company shall enough as provided by thus Article, typic as if the Capital Redemption Reserve Fund were paid-up share capital of the Company.

(2) Subject to the provisions of that Article, the redemption of Preference Shares thereunder may be effected on such jernis, and in such promote, at may be provided by the Article of the Company.

(1) The redemption, under this Article of Preference Shares by a Company shall not be taken as reducing the amount of the authorised share expected the

shall not be taken as reducing the introduct of the authorated space capital of the Campany.

[4] Where, in pursuance of this Article, a Company has reducemed, or it is about to reduced, any Preference Shares, or hall laws power to issue shares up to the pomental answart of the shares broken too for a since the company has the technique of the product and, acqueduagly, for the preference of say exacutions relating to thompsiles. Inspiration flees, this shares in pursuance of this postagraph:

Provided that, where new shares are smuch before the redemption of the old shares, the new phares study not, so far an relative to any such enactment as abstracts, the new phares study not, so far an relative to any such enactment as abstracts, the decimed of have been broaden in pressuance of this postagraph unless the old shares are redecemed within the period of their plays buginning with the day of sever of the sec-shares.

[5] Notwintestaking any thing in this Article, or or the principal Law, the Capital Redemption Reserve Fund may be applied by the Company in paying or man-world shares of the Company for root to shareholders thereous a three of the paying or man-world shares of the Company for root to shareholders thereous a heavy paying or

bruns thates."

11. Directory:

A Directory is not required to bold any shares by way of qualification. There are pure-bloom-requiring Directory as a say speedings. No remainstration for the Directory has set been fixed by the Company in General Meeting.

1 A: Bennett e a Director of the Managers as well as of CTIPUNDS, The other Directory of the Managers as 1. C. Morgan, P. Page, J. K. Shickts, Dr. H. Thorston, D. S. Van Pelt and J. F. Witts,

There are no cristing or proposed service agreements between the Company and any of as Ourcease.

A ratches of Association of the Company crushin, inver alia, provisions to be following effect:

1) The Directors are emitted formed recommend to shall be determined by the company in general succing, Such renumeration to shall be determed to account from day to day. The Directors may take be paid travelling, both and other expenses properly incorred by them as attending and insurance from meetings of the Directors are other as a travelling, both and other expenses properly incorred by them as attending and insurance from meetings of the Directors are other securities or in connection with the baseness of the Company, and the properly of the Company of the Directors are other securities or at the request of the Company; by Director in microhing Director shall be depaulated by be office from contracting with the Company, nor shall any such contract (or any contract or arrangement custom sites by or on behalf of the Company in which any Director is meanly way interested be hable to be avoided, nor shall any Director in an econtracting or being so therested the labels to account in the Company for any protectors are contractor bedding their office or of the inherity relationship thereby established, but the nature of his interest must be declared by him at laken into consideration:

A Onestor shall not vote an respect of any contract or arrangement to first laken into consideration:

A Onestor shall not vote an interest of the succession or other recommend of the processes of the company of the contract or arrangement to first laken into consideration:

A Onestor shall not vote an respect of any contract or arrangement to first laken into consideration:

A Onestor shall not vote an interest of the contract or arrangement to first laken into consideration:

(i) the giving of any security or indensity to him in respect of successes or other recommend. (h) No Dire

chiqueta ne nicurreal try heat at the respect to for far the benefit of the Company or nary of its subsidiaries;

(i) the grains of any occurred in subsidiaries;

(ii) the grains of any occurred or indefensity to a third party in respect of a deby we obligation of the Company or any of its subsidiaries for which he hented has a sometimed responsibility in whole or mart under a guarantee or indemnity or by grains of vocurry;

(iii) are proposal concerning an offer of shares, debentones, or securities of or by the Company or my of to subsidiaries as which be as or is to be immensed as a participant is the underwrining or sub-moderwriting.

(iv) any proposal concerning any other company in which he in uncreased diverty or indirectly, and whether as an officer, shareholder or otherwise provided that he is not the holder of or boundaries of the or sure of any class of the equity share capital of such conspany.

A Director stay be or may become a director or other citizet of or unsuber of any company in which the Company may be instrumed and quiets otherwise agreed) no such Director shall be accordative in the Company for any ensurements or other busides received by him as a Dercotor or other officer or such as a considered of the company (other than the utility of the course of office or place of profit under the Company (other than the utility of the office or place of profit under the Company (other than the other officer or place of profit under the Company decreases;

Every Decetor, the Secretary and other officer or servance of the Company.

determine; Every Detector, the Sceretary and other officer or servent of the Company and be indemanated by the Company against all nosts, losses and expenses which are meatred as a result of their ultime in relations to the Company and are entitled to a lien on the Company to shareful or a lien or the Company to shareful or a lien or the Company to shareful or a lien or the company to shareful or
Auditors' Report: Equity & Law Flores, La Mouse Street, St. Heifer, Jersey, Channel Mands. 21st May, 1983 The Directors,
Channel Islands Transetlance Investment Funds Limited.

Channel Islands Transplants in restrict Funds Limited was incorporated on 27th April, 1983, under the laws of the Island of Jersey, it has not commerced business and accordingly on accounts have been prepared and on drydends have been declared or gaid.

Yours faithfully.

Peat. Marwick, Mitchell & Co.

Charvered Continuers

The fullowing constants have been entered into by the Company three his
incorporation and are material.

(2) Management agreement dested that May 1973 between (1) the Company,
(2) the Minagers and (2) the Investment Advisers whereby the Managers
have been appearant (with powers of sub-delegation) in manage the
Company's been appearant and enterestrative affinition and to promote
the distribution of a Pericipating Shares, subject to the quarted of the
Daryton, and to set as Secretary to the Company. The Agreement contains
provision indemnifying and exempting the Managers from habitry and the
terminated, unser aim, by either party or 6 mouths notice but no such source
shall be effective unless and soul replacements managers have been
appointed.

shell be effective unless and gutil replacement managers have been appointed. Contodium Agreement dated 2ht May 1983 between (1) the Company, (2) this proposition of the Contodium under which the Custodium has been appointed to be reprosented to the ante custody, of the easets of each fund. The Agreement contains probations indemnifying and ancoupting the Custodium from liability not the to its widel breach of duty or grown negdigated and crudiers on the Custodium or night of recompe. Against the Company, or the Agreement may be reministed, inter-ship, by the Custodium or the Company or remember motion been appointed.

Investment Advisors Agreement chiefed 2ht May, 1983 between (1) the Company, (2) the Managers and (3) the Investment Advisors whereby the Managers appointed the Investment Advisors to recommend investments and above those photos unvestments under regular review. The Agreement contains provisions medicantly age, and champing the Deveatment Advisors Advisors from liability not due to their writted breach of duty or grow negligation. The Agreement may be streamented, and and the processor of the measurement and the streament of the processor of the measurement provisions and the processor of the processor of the measurement of the processor of the p

Letter dated Nut May, 1985 between (1) the Company and (2) the Managers under whet the latter open to deshauge the Company's forestates and prelimatory costs and the expenses of the total offer of Participating States (including the cost of House, the Participating States of each clean on The Stock Exchange), which are extended to amount on U.S. 277, 200, and the Company agrees to resuduce the Managers for weeting these costs and expenses at the rate of 0.0, per cents, you make the Managers of the aggregate of the next.

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Scottish Provident chief

appointed Mr Gerald H. Elliot chairman in succession to Mr James A. Lumsden. Mr Eiliot is chairman of Christian Salvesen and chairman of the Scotish Arts Council. Mr Ellot's successor as deputy chairman is Professor Ian. G. Stewart, Professor of Economics at the University of Edinburgh.

May 23 1953

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Mr N. Colker, president of Accounting Corp of America, has been made a director of AIDS COMPUTER SERVICES and AIDS (FRANCHISING).

Mr Peter Dellar has been appointed to the board of CHARLES BAYNES. He was chairman of St Georges Laundry and has recently acquired a 30 per cent interest in Charles Baynes, and is making a full

The board of BERISFORDS has been reconstituted following acquisition of British Trimmings (Hotdings): Mr D. R. B. Myners, chairman; Mr S. J. Sebire, deputy chairman and joint managing director; Mr A. W. Laughton, foint managing director; and Mr R. G. H. Fielding, Mr T. Plenderleith, Mr A. Rosenblatt and Mr A. F. Sebire as directors. Mr J. F. Sebire has retired from the board but continues as bonorary president. tinues as bonorary president.

Mr Haw Manton bas been man nuw manton oas been appointed a director and general manager of BARCLAYS BANK INTERNATIONAL in place of Mr Laurle Cockburn who is retiring on September 28 after 43 years' service with Martins Park and the Persilect Courts Bank and the Barclays Group.

Mr Peter Cawsey, divisional general manager of Barclays Bank International's management services department, will succeed Mr Manton as a regional general manager.

Mr Nicholas Bostkowski, vice president of the Chase Manhattan Bank and executive director of Chase Manhattan APPLIANCES has appointed assistant director.

GROUP in July, He will become director and member of the hoard of Enskilda Securities in London and will be the head of the representative office of Skandinaviska Enskilda Banken in Paris.

Mr Brian Eyers has been appointed sales and marketing director for BOSTIK. Previously be was bead of the DIY division of Berger Paints for six years.

AIDS COMPUTER SERVICES and AIDS (FRANCHISING).

**

Mr G. Michael Hostage, chairman, president and chief executive officer of Howard Johnson Company, U.S., has been appointed to the IMPERIAL GROUP board.

**

Mr Walter C. T. Crosby, general manager (trustee and investment) is to retire from the ROYAL BANK OF SCOTLAND on May 80. Taking over as general manager (trustee and investment) is Mr Douald A. Cameron, who was previously secretary of the bank, Mr Cameron joined the bank in 1949.

Mr Peter Dellar has been appointed to the board of the board

Mr C. R. Gray becomes deputy chairman of DUPORT. Mr C. I. Cooke has been appointed to the board. Mr Cooke is chairman and managing director of Duport Harper Foundries and is chairman of the companies compris-ing the Group's computing interests.

Mr N. O. Tanbe has joined the board of PRECIOUS METALS

Senior appointments have been made by TSB SCOTLAND, which is to be launched on May 21 following the merger of the four present TSB's—Abendeen, South of Scotland, Tayside and Central Scotland, and West of Scotland, Machania, B. Darid. Scotland, and west of Scotland. Mr Anthony B, Davidson has been appointed general manager—special duties, from his post as general manager of the TSB of Tayside and Central Scotland. Mr David A. McLean has been appointed general manager—prical encertions. manager—retail operations, from his present position as deputy general manager of the West of Scotland TSB, Appointed area general manager west, is Mr James H. Chapman, from Pais-ley. He was assistant general manager (personnel) for West of immunology.

SCOTTISH PROVIDENT has Limited, will join the SKANDI. Mr D. A. Hopkins national sales populated Mr Gerald H. Elilot NAVISKA ENSKILDA BANKEN director.

Mr Terry Stewart has been appointed managing director of ELSENHAM QUALITY FOODS. He joins from Sheaffer pens where he was managing director. Mr Tony Blant is retiring to concentrate on his other business activities but will continue to act as a consultant. Eisenham is a James Burrough company.

Mrs Elizabeth Wood has joined the partnership of GREENE & CO., stockbrokers.

AM INTERNATIONAL (HOLD-INGS), a subsidiary of AM Inter-national Inc, U.S. has appointed general managers for each of its three divisions in the U.K. Mr David Sear, director of sales and marketing bas been promoted marketing has been promoted to general manager of the largest division — Multigraphics. Mr Alan Senlor moves from general manager of AM Varityper UK to general manager of Admel division. Mr Lawrence Wallis, director of product support, has been promoted to general manager of AM Varityper UK.

BRIGHTON MARINA COM-PANY chairman, Mr Humphrey Tiling, and its managing director, Mr John Perkins, will retire in June. Mr Tilling will be succeeded by the deputy chairman, Sir Kenneth Cork. Mr Perkins successor will be Mr Peter Blackburn at present finance director.

Mr David Anslow, general manager of the agricultural division of Shell Chemicals UK is the new chairman of the BRITISH AGROCHEMICALS ASSOCIATION. New deputy chairman is Mr Reg Norman, managing director of Ciba-Geigy Agrochemicals.

Mr Graham L. Drake and Mr Reith R. Egerton have been appointed ioint managing directors of COUNTY AND DISTRICT PROPERTIES and its subsidiaries. Mr Leslie W. Melville has relinquished the managing directorship but continues as chairman.

Dr E. S. Lennox of the Labor atory of Molecular Biology, Cambridge, and a recognised expert in the use of monoclonal antibodies in immunological research, bas been apnointed CELLTECH'S consultant director of immunology.

This advertisement is published by Thomas Tilling pic, whose directors (including those who have delegated detailed supervision of this advertisement) have taken all reasonable to ensure that the facts stated and opinions expressed herein are fair and accurate and each of the directors accepts responsibility accordingly

InterNed is Thomas Tilling

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InterMed is an International group of health care companies, specialising in the manufacture and supply of a wide range of medical, dental, laboratory, veterinary and rehabilitation

PLANT AND MACHINERY

INTERNATIONAL **MACHINE TOOLS AUCTION** Torino (Italia) June 6 to 8 1983

From Monday June 6 to Wednesday June 8, 1983, Compagnia Internazionale Aste will hold an exceptional auction of 431 machine tools of all types at Via Modena 31, Torino. The equipments on auction are owned by: Olivetti, Innocenti Santeastacchio Innse, Mandelli Industriale, Rambaudi Industriale, Misal Industriale, Sarma Officine, Berco, Dellavia, Teknital Merloni, Carnaghi Pietro, Ema, S.I.V., Tacchella Macchine, Streparava, Biglia, Gernetti, Bakiler Uno, Giana, Castel, Rostagno & Cassulo and other plants. All machines are open to inspection before the auction at the 23 owners'

plants from May 23 to June 3, 1983 and will be sold to the highest bidder. In view of the large scale of the operation - total aaction basis It. Lire 7.232.910.000 - which will bring to Torino operators from the five continents, Compagnia Internazionale Aste, Via Modena 31, Torino, Tel. (11) 287.142-279.874-274.30.70 is available at all times for any further information and clarification that might be required.

Thomas Tilling



The sum of our parts makes us strong

Builders' Merchanting. Construction Materials and Services. Electronic Equipment and Supplies. Energy Equipment: Health Care, Electrical Equipment Distribution, Insurance, Manufacturing Engineering, Furniture, Publishing, Textiles, Tiles and Pottery, Japan Trading,

CHANNEL ISLANDS TRANSATLANTIC INVESTMENT FUNDS LIMITED (Continued)

- 16. Proliminary Engences of the Company.
 The Coropany's formation and prefininging costs and the experiences of this install offer of Participating Shares methoding the cost of lating the Participating Shares of each chast on The Stock Exchange) are estimated to amount in aggregate or U.S.4275,000. These will be horne by the Managery and will be charged to the Company at the rate of 0.1 per cent. per amount of the aggregate of the near values of the Fands.
- 12. General
 The Company is not ougaged in any linguition or arbitration and the Directors
 are not aware of any fragation, arbitration or chains pending or threatened against
 the Company.

 The Company has not established, and does not mised to establish, a place of
 beginness in Great British, nor has it carried on any business prior to the date of this
- The Company has not established, and does not mean a resources, a pure to business in Great Britain, nor has it curried on any business price or the date of this Pruspectut.

 On 18th May, 1985, the Company had no borrowings or indebteduess in the matter of borrowings, including bank overthells, lean capital outstanding for created but mainted and no outstanding morningset, charges, inhelblies under acceptances, or acceptances credits, let a purchase commitments, loans, guazantees or any other material countagent habitates.

 In view of the arrangements for the payment of the predictions, guazantees described in paragraph 15 (id above, there is no motionisms amounts which in the upunion of the Direction small be raised by the proposed since of Petrolipating Stares or, save as mentagened in paragraph 15 (id), required to be provided out of the processes of such some in order to provide for the number referred to m paragraph 4 of the Fourth Schectisle to the Companies Act 1946 of Great Striam namely:
- the purchase price of any property; any prelimmacy expenses; the repayment of any moneys borrowed for the focegoing, and working control.
- (c) the repayment of any moneys borrowed for the foregoing; and (d) working capital.

 Poat, Marwick, Mitchell & Co., Ierary, have given and have not withdrawn there written consent to the laws of this Prospectus with the section therein of their seport in the leven and context in which it appares.

 The provisions of Section 50 and 31 of the Companies Act 1948 of Great Britain older than the penal provisional in fan amplicable (having regard to Section 419 of the Act) their apply to the testinal offer.

 No Derector has my interest in the procussion of the Company or in any property acquired, thingoord of by or leveled in, or proposed or to acquired, disposed of by or leveled to, the Company and so Durector has material interest in my contract or arrangement estered into the Company which is significant in relation to the business of the Company.

 No communities, discounts, brokeright or other special terms have been spanted or are payable by the Company in consection with the state of any capital of the Company.

 New for the Fundaces Sharet, so share or lean capital of the Company has been reasoned and agreed to be assert fully or partly used up for each or otherwise; has been successful and the parameter of the company.

 There is no property purchased or acquared by the Company or proposed to be purchased or acquired.

 There is no property purchased or acquared by the Company or proposed to the purchased or acquired. Notes of the Chesses of the Company bas an interest in the share capital of the Company which mould be required to be shown in the regater maintained under the purchased to the provisions of that Act.

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- regimeness squee of the company:

 (i) the Merogramdom and Articles of Amountion of the Company:

 (ii) the report and contents of Peat, Marwick, Mitchell & Co.;

 (in) the unstread contracts; and

 (is) the Companies (Articy) Laws, 1901 to 1968.

 21st May, 1903

APPLICATION PROCEDURE

- Application may be made by either of the following methods:

 (a) Written application away the Application Form appoint accompanied by paying in the most of a chaque or Banker, Orab.

 (b) Felex application in the prescribed form, supported by payment in the form of a bank issued telegraphic transfer.

 Please state in your application whether you wish your stare certificate(a).

 Please state in your application whether you wish your stare certificate(a) to registered in the same of the Castodian to boild as nommer on your behalf.
- be registered in the name of the Chandram to once a channer or your sense. Whites a Application:

 "Resist complete the Application Form and entities a change or Bankers Draft for the relevant amount, psychole to Channel Islands Transmitants Investment Fands Limited. Your payment may be in any of the following conventment Fands Limited. Your payment may be in any of the following conventment Fands Limited. Your payment may be in any of the following of the class(es) of Participating Shures being subscribed. Please note that the Dractors reserve the right to delay the arrangement of Foreign Ewshape (if applicable) or allotment of Participating. Shures used final clearance of the physiquent to received from the Bankers. In outset other than sterling decepting symble at a bank within the U.K., the Directors strongly recommend the use of a Bankers Draft drawn payable in the appropriate currency centre, since clearance of personal changes are usually subject to a greater delay.
- some checouri are usually subject to a greater delay.

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- ring: Jersey AC No. December 2010 Children N.A., Green Street, Children 1. Channel Islands Transationale Investment Funds Limited On Citchent (Channel Islands Limited, P.O. Den R.A., Green Street, S. Heffer, Jersey, C.T. Belev No. 472-33.

 If We apply to the set in light closed of Participating States of Channel Islands Transationity Invusional Transationity Invusion of the terres of the Prospectus class of May, 1983 and subject to the prostoron of the Memorandam and Articles of Association.

 For this purpose, I've have methaned Juste mane and address of your bently to remain light current, securing the Islands and cityl for the accessed of "Chilbren Islands, N.A., Israey, Accessing Memorandam and Articles of Association of "Chilbren Islands, N.A., Israey, Accessing No. 18 specified above) Favore CTTPL/NDS" on the lume, 1980, who have been instructed to sittem you of the Terretaining Shares are not being acquired doctly for indeventy by a U.S. Pervon to the Chilbren Islands of the Speciation of the Speciat
- Foreign Exchange (ill applicable) or businessession of the prement in confirmed by the Bankers.

 Contract Notes:

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 Any inventor who has not given the necessary matter and residence declaration and be required to complete and return to the Contract an Application Form, which includes such a declaration and responsible processing Sample allowed by the Contract Notes, will not actually be numed before the Complete allowed by the Contract Notes, will not actually be numed before the Complete processor and advanced before the Complete processor and the succession of the succ

Contilication: Where appropriate, share conditiones representing the Participating Shares issued will normally be despaticated within seven days after 6th hone, 1945. The Company reserves the right to reject any application or whole or in part, in which causes the application moneys or any behavior will be returned by post at the right of the application.

CITIFUNDS APPLICATION FORM To: Channel Islands Transationale Investment Paints Limited, % CREment (Channel Islands) Limited, Channel House, PO Box 104, Green Street, St. Heller, Jersey, C.L. Telephone: Jersey (8534) 78334 Eden: 4592436 I/We hereby acknowledge that I/we have received and considered a Prospectus dated Zist May, 1963 relating to Channel Islands Transmitants Investment Funds Lineared and that this application is made on the terms thereof and subject to the provisions of the Memorandom and Articles of Association of the Company. I/We apply to street in the class(es) of Participating Share in the Company in indicated below. Applicants withing to invest in a single class of Participating Shares should place as "X" in the relevant box. Applicants whiting to invest in more than one class of Participating Shares should indicate in the relevant boxes the percentage of their total investment to be made at each class of Participating Share. Deutschemark Shares Japanese Yen Shares U.S. Dollar Shares __ payable to Channel Islands To UNC enclose a continuous for payable to a nearman section of first procession. If the earthorner was to end to melve by prof at suprime risk to the address first synthem below a continuous sole and: "enter (a) to register in the name of lusar full stoke and address), and to send at its and address; the plant continuous and address; the suprime follows are supported. The Participating Shares of each class for which this application is accepted: "or (b) to register in the same of and issue the whare terrificance(s) to the Castedam an respect of the Participating Shares of each class for which this application is accepted and authorise the Castedam to hold the covering state certificance(s) and to act in accordance with any-local workform written or tries asstrations in respect thereof. If the hereby declare that the Participating Shares are not being acquired directly by a U.S. Person" not in violation of any applicable has and that they will not be crured herefoldarly by a resident of Jersey or by anyone who at, at the date of this application, has thus therefolds by you of any change in any four measurements that would result in my four being another or give this declaration, if saled the class of the substant of any change in any four measurements that would result in my four being another or give this declaration, if saled the class of the substant of the substant or give this declaration, if saled the class of the substant or give this declaration, if saled the class of the substant of Christian Nantels) (in full) Surnante and designation (Mr., Mrs. Miss or Title) Address (in Inl.) Day time Telephone No. (In the case of Joint Applications, all further Applicants must see and complete below.) Full parte Address (m full) Address (inclinall)_ "Frame of lease whichever is interpringulate." "Please delate whichever is interpringulate." "Please delate whichever is interpringulate." ""U.S. Person or laters a neighbor of resident of the United States of America, a partnership organised or existing to any state, terratory or possession of the United States of America, a corporate in exposured under the lases of the United States of America, a corporate in exposured under the lases of the United States of America, a companies to not delected, or any state or trust, other than an existe or trust for interest which it form sources conside the United States of America (a material is not delected), consecred with the constant of a trust or behaviors, within the United States of America, in included in grow seconce for the purposes of computing United States federal macrons tax. For the purposes of this definition, "United States of America," includes the United States of America, its terratorics and possessions and arrest subjects to be production. If you are notified as make the declaration, you may still be able to certain circumstances to subscribe for Participating States, but you should contact the Managers for details.

15

FINANCE FOR INDUSTRY TERM DEPOSITS.

Deposits of £1,000-£50,000 accepted for fixed terms of 3-10 years. Interest paid gross, half-yearly. Rates for deposits received not later than

3/6/83
TERMS(years) 3 4 6 6 7 8 9 10
INTEREST % 101 101 101 11 111 111 111 111 111 Deposits to and further information from The Treasurer, Finance for Industry plc, 91 Waterloo Rd., London SEI 8XP (01-928 7822, Ext. 367). Cheques payable to "Bank of England, a'c FFF" FFI is the holding company for ICFC.



Arrow Capital N.V.

Established in Curacao (Netherlands Antilles) Established in Curacao (Netherlands Antilles)

Notice of Annual General Meeting of Sharebolders
to be held on June 13, 1983

Notice is hereby given that the Annual General Meeting of
sharebolders of Arrow Capital N.V. ("the Company") will
be beld on June 13, 1983 at 11.00 o'clock in the forenoon
(local time) at the offices of the Company, 6 John B.
Gorsiraweg, Curacao (N.A.) for the following purposes:

1. Report of the Managing Director on the course of business
and the management of the Company during the fiscal
year ended September 30, 1982.

2. To approve the Company's annual accounts for the
financial year ended September 30, 1982.

3. To ratify, confirm and approve the acts of the Management
and the Advisory Board.

4. To elect a Managing Director for the ensuing year.

- To elect a Managing Director for the ensuing year.
 To elect an Advisory Board for the ensuing year.
 To appoint Independent Auditors for the ensuing year.
 To transact such other business as may come before the

meeting.

The official agenda of the meeting together with the annual accounts for the Company's financial year ended September 30, 1982 may be inspected by all shareholders at the offices of the Company as well as the offices of its sponsoring hanks, viz: N. M. Rothschild and Sons Limited, London; Pierson, Heldring and Pierson N.V., Amsterdam; Banque Bruxelles Lambert S.A., Brussels; Banque Privee S.A., Geneva; Rothschild Bank A.G., Zurich; Banque Internationale a Luxembourg S.A., Luxembourg meeting.

hourg.
Holders of registered shares shall be entitled to vote at the meeting to person or by proxy. Holders of bearer shares shall be entitled to vote at the meeting on presentation of their share certificate(s) or of a voucher given by any of the conserving hanks stating that share certificate(s) Company's sponsoring banks stating that share certificate(s) in respect of the number of shares specified in the voucher have been deposited until the end of the meeting.

The Managing Director Intimis Management Company N.V.

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A FINANCIAL TIMES SURVEY ISLE OF MAN

JUNE 6 1983 The Financial Times is proposing to publish a S Isle of Man in its issue of June 6, 1983. The provisional editorial

INTRODUCTION Developments in the banking scene dominate the economy of the Isle of Man. The appointment of a banking supervisor and the reports submitted to the Manx governments are indicators of the seriousness with which the authorities take the creation of a stable banking and financial community. Banking is only one aspect of the Manx economy and the Survey will look at developments which are taking place in the more traditional sectors. include: BANKING BANKING INSURANCE POLITICS
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BRITAIN'S BUSINESS CENTRES

Aberdeen

Bright prospects for the Granite City

ABERDEEN has never had it so good-and it looks as though the ancient granite city is about to have it even

The development of offshore oil fields over the last decades has brought a vast and highly technical industry to this city which had a relatively modest past in fishing, textile, paper and engineering.

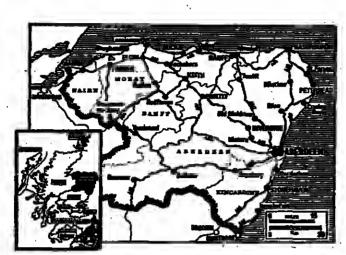
The city today exudes a prosperity unlike any other in Scotland, based on an industry paying above average wages and now accounting for about 40,000 jobs.

Aberdeen has traditionally had low unemployment and presently this remains around the 7 per cent mark, compared with the 15.1 for Scotland and up to 24.1 per cent in industrial blackspots such as the Irvine area of the south-west.

The major oil corporations and their attendant array of companies feeding them services and equipment have had a profound effect on all areas of the city economy,

It seems that the crowds on Union Street, the main shopping area, show a similarity to London's Oxford Street during the sales.

The airport can give the visitor the first real feel of excitement for this new industry as squads of beli-copters queue up in the early morning to take crews out to the offsbore installations. The barbour throbs with supply boats, fishing vessels or ferries



With the forecast of decades of offshore oil operations in the North Sea, the future of Aberdeen looks increasingly promising. This confidence is highlighted by plans for an international trade centre in the city to sell products and services to the world's offshore operators.

> REPORT BY MARK MEREDITH PICTURES: ROGER TAYLOR

market, or a construction company's building programme for

In this city, international oil market and production forecasts are read as farmers might scrutinise the weather report.

Fluctuations in the international of the 1970s may be over, industrialists in Aberdeen are considered there are decades of after a slack winter with little new activity.

Fluctuations in the international officers are read as farmers might fident there are decades of after a slack winter with little new activity.

break into a highly competitive dependent on oil and gas. The budget proposals on oil has brought new encouragement for the offshore industry. The

of oil allowance for future fields, an abolition of royaltles on fields granted Government approval after April 1, 1982, progressive phasing out of the petroleum revenue tax in the period up to 1986 and tax relief on shared assets, such as pipe-

But the lead times between the discovery of oil in a new field and new orders for equip-

the magnitude support services for the 20 offshore fields presently in production and others in early development continues to provide business for Aberdeen.

ment in the history of the off-shore industry.

Leading figures from the private sector bave proposed the construction of a trade centre in the city to act as a market place for British companies trying to sell products and services to international offshore

The significance of the centre is that it is aimed at correcting an imbalance of UK to foreign groups which are active off-shore. The North Sea required the know-bow and resources of the American oilmen. But, to date, there are many areas of technology and service where treeport could be around Dyce British companies have yet to make their mark.

The trade centre would oper-

These measures are expected to generate new moves into marginal oil fields off the Shet-land Islands and in the deeper waters of the North Atlantic where a whole new generation of production technology will.

ment to bring it up commer-cially can take months or even

In the coming year, the city will see a fundamental devalop-

ate on a commercial basis, offering consultative services, such Fluctuations in the international well as continued new explorafortunes of oil can influence tions and the exploitation of ete relief against petroleum
new building decisions, a move marginal fields—all promising revenue tax for expenditure and by a new company seeking to a news for a city now very much appraisal activities, a doubling and lost time cost hundreds of University of Aberdeen which as marketing a jvice to help new



Aberdeen harbour, thronged with supply hoats, fishing vessels and ferries serving Orkney and Shetland. Aberdeen is lobbying vigorously for "free port" status which would provide a further stimulus for the oil industry

thousands of pounds.

According to estimates in a joint study by the Scottish Development Agency (SDA) and the North East of Scotland Development Authority (NESDA) which is part of Grampian Regional Council, spending offshore this year on exploration, development and operations will be around \$3.5bn, rising to over £6bn in 1998.

According to current estimates from the Government's in Aberdeen Offshore Supplies Office, 73 per But the tra cent of the contracts for the £2.26bo spent by the offshore operators in 1982 went to British companies. But this figure includes UK subsidiaries of American companies, many of them based in Aberdeen.

Another important development in the coming year could be the Government decision on a free port. Aberdeen has lobbied vigorously for the nomination feeling it would provide yet further stimulus for the ail industry.

Airport and the rest near the harbour to eater for the different types and size of off-shore exported equipment. The Scottish Development Agency has plans to develop a science park joined to the

Aberdeen has been easy to neg-lect in terms of the attentions

of development bodies.
Industrial decline bas blighted much of Scotland, calling on the full resources of bodies such as

could supply a new focal point of this city such as textiles, fish for high technology industries processing, paper and engineer-with offshore applications. coming industries in the manuprocessing, paper and engineer-ing have been severely damaged during the build up of offshore For a city in the midst of interest.

Britain's largest industrial revenue maker, the city of These manufacturing industries have declined at a rate similar to that of Strathelyde in the heavily industrialised

west of Scotland.

A oil and non-oil economy has been created leading the region to resist strongty the Development Government decision to remove assisted area status for most of Agency, which has a low profile Aberdeen. Grampian and bence remove But the traditional industries grants and other benefits to in-

Support services for 20 effshore oil fields provide big business for Aberdeen

facturing settor.

New inward investment in non-oil industries is now unlikely. But a development study for the city recommended

greater attention on industrial diversification, especially in the area of microelectronics which has good potential applications to offshore work.

Aberdeen throughout this past decade has kept its grey granite character and the centre of town has not heen totally overtaken by new developments. The offices and the indsutrial estates cluster like satellites around the periphery of the city. pbery of the city.

Aberdeen lacks the layer of dustrial soot of big cities reflecting the modest size of its traditional industries,

In the field of office and commercial property, the day is past when the oil majors will gobble up huge chunks of space and more smaller units are in demand. The four-year supply of space now available is a worry to property men.

New operators may, however, appear on the scene with future rounds of licences and they will require beadquarters and staff. They will also buy at the local shops, fly from the airport and add further to the prosperity of a small and ancient city which now enjoys a relative economic "high."

Institutions which have pre-funded or purchased our developments in Aberdeen include -

- Confederation Life Insurance Company
- Electricity Supply Nominees (Scotland) Ltd.
- National Farmers Union Mutual Insurance Society Ltd
- Pearl Assurance (Unit Funds) Ltd
- RMC Pension Trust Ltd
- The Royal National Pension Fund for Nurses
- Strathclyde Regional Council Superannuation Fund

The Company was founded in 1863 and since its move into the property development and industrialfield in the mid 1970's Mountleigh has acquired a reputation for excellence in design and quality of construction. The Group is also currently developing in London, Glasgow and West Yorkshire.

Mountleigh has recently leased its three residential Estates in Suffolk to the United States of America for occupation by USAF personnel at an annual rent in excess of £2m.

Five year financial re	cord				
	1982	1981 £'000	1980 £'000	1979 £'000	1978 £'000
After tax profits	647	378	453	347	152
Earnings per share (pence)	16.15	9.42	11.30	8.64	3.78
Dividends per share (pence)	4.00	3.50	3.00	1.44	1.29
Assets per share (pence)	172.05	142.75	83.55	63.98	56.60

Tenants of our Aberdeen projects include —

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- Lunn Poly





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- adjacent to harbour and inner ring road,
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- units available 3,000 sq ft, 5,000 sq ft and 9,000 sq ft.
- •available summer 1983.
- Altens: Blackness Industrial Centre
- units sizes from 2,500sq ft with secured storage yards. short or long leases.
- available June. Joint Agents — F G Burnett, Aberdeen Dyce: Airways Estate (Phase II): Pitmedden Road
- units from 2,000 sq ft with secured storage yards. immediately adjacent to Aberdeen Airport.
- short or long leases.
- just completed.
- Joint Agents F G Burnett, Aberdeen

OFFICES

West End: 7/8 Rubislaw Terrace

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- mix of individual and open plan offices.
- exclusive car parking.
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- City Centre: Chapel Street
- 35,000 sq ft office development within yards of Union Street. parking for 50 cars.
- available mid 1984. Joint Agents — Richard Ellis, Glasgow

LAND

Mountleigh has prime land available and can provide accommodation to meet any requirement.

ABERDEEN II

New projects in marginal oilfields will boost Aberdeen's oil-dominated economy

44,000 oil workers now based in the region

OIL has taken over the Aherdeen economy. An esti-mated 44,000 workers in the Grampian region are in oilrelated employment, 95 per cent of whom are based in Aberdeen. The city itself is small with a population of

The very strength of the oil economy has to a certain extent formed a dual economy with a lower category of wages costs and for the tradi-tional non-oil industries.

Aberdeen watches key national and international factors affecting oil production as a weathervane to the city economy. Official surveys of the economy for the surrounding region usually include a review of forecasts for further oil development.

Government's tax structure and low oil prices have made this a compara-tively cold winter for Aberdeen, although many other cities in Scotland and the rest of the UK would dearly wel-come an economic climate such as this.

Uncertainty

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But reduction of offshore work quickly spreads onshore to the industries downstream. Supply boxts wait for new contracts tied up in the harhour. House prices move uncertainly.

The budget stimulus to oil is seen as opening a new era

benefits for the economy in enhanced consumer demand from the raising of personal tax thresholds. However vigorous the stimulus from the Government, downstream industries remain aware of the long lead times involved before con-

tracts percolate down from

the offshore operators.

tracts.

A year or more can lapse from the time an oil company starts to drill to the time it decides to develop a field for of development with new drillings and exploration in mar-ginal fields and a host of eagerly awaited service con-

But in the background of planners and the Government The Quarterly Economic Journal of the Grampian region, which surrounds is the multiplier effect the offshore industry has — one job offshore means about two Aberdeen, points out other

Training

In 1982, the oil majors employed nearly 9,000 people in Grampian and according to interviews conducted with the companies in 'the region's department of physical planning, employment in 1988 could rise to 10,970 and by 1991 to 13,260.

In March, the Manpower Services Commission published an in-depth study of the manpower needs in the region and noted that skill shortages had eased although demand would grow over the next five years.

The report urged a greater attention to training for specialist and technician skills if shortages are to be avoided

The report forecast that employment of craftsmen and technicians would expand at twice the rate of total

in future.

Occupations such as elec-trical and electronic techni-cians, instrument technicians, and instrument mechanics are much in demand and nearly 30 per cent of the companies interviewed by the Manpower Services Commission antici-pate trouble in recruiting.

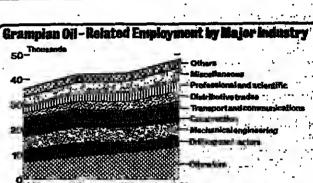
A feature of the growth decade for North Sea oil has been the increase in British personnel in all aspects of

onshore and offsbore work and there should be no shortige of personnel to carry out the most sophisticated work, according to Aberdeen indus-trialists.

North Sea Oil Operations - Estimated

INVESTMENT IN THE OIL INDUSTRY

	1883	1384	TA92	7900
Exploration: Surveying	0.045	0.063	0.065	0.077
Exploration appraisal	0.634	0.563	0.546	9,528
Development: Production platforms .	1.353	2.987	2.893	3.620
Installation gas	0.324	0.102	0.290	0.465
Plant and equipment	0.151	0.759	0.607	0.008
Submarine pipelines .	0.041	-		
Development drilling	0.299	0.308	0.317	0.352
Terminals	0.822	1.98	1,272	1.332
Operating: Maintenance	0.298	0.299	0.310	0.341
Transport	0.576	0.588	0.607	0.674
Diving services	0.174	0.178	0.183	8,204
Drilling services	0.387	0.398	0.408	0.452
Offshore support	0.185	0.178	9.185	0.222
Miscellaneous	0.213	0.220	0.225	0.250
Totals	5.494	7.733	7.297	9.428





(21,140 resident, 14,809 non-resident), total: 35,949. Forecast for 1991: offshore, 21,550, onshore, 25,940, resident, 33,900, non-resident, 13,600, total 47,500

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> For more information, please contact: J R Turner Esq., General Manager, Aberdeen Harbour Board, 16 Regent Quay, Aberdeen AB9 158

Estimates (in \$10 at 1982 prices) by the Scottish Development Agency and the North-East Scotland Development Authority of investment in oil-related activities

	7883	1384	T993	100
Exploration: Surveying	0.045	0.063	8.065	0.07
Exploration appraisal	0.634	0.563	0.546	9.52
Development: Production platforms .	1.353	2.987	2.893	3.62
Installation gas	0.324	0.102	0.290	0.46
Plant and equipment	0.151	0.759	0.607	0.90
Submarine pipelines .	0.041	-		·
Development drilling	0.299	0.308	0.317	9.85
Terminals	0.822	1,08	1,272	1.23
Operating: Maintenance	0.298	0.299	0.310	0.34
Transport	0.576	0.588	0.607	0.67
Diving services	0.174	0.178	0.183	0,20
Drilling services	0.387	0.398	0.408	0.45
Offshore support	0.185	0.178	9.185	0.22
Miscellaneous	0.213	9.220	0.225	0.25
Totals	5.494	7.733	7.297	9.42



Shortages of skilled labour in Grampian have eased, although demand will grow during the next five years, according to a recent survey by the Manpower Services Commission.



Employment figures, 1981: offshore 19,450, onshore, 16,499

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Traffic soars at the world's largest heliport

THE TIME: 7 am. The place: Aberdeen Airport, where a scene in the drama of Nouth Sea oil development is begin-ning to unfold.

On the tarmac are ten or more belicopters, their rotor blades whirling as permission is awaited to fly-out crews to off-shore oil platforms, explora-

tion rigs or drill-ships.

The helicopters, for safety reasons, hover at the end of the runway and then move down the length of the tarmac as they gain height. It is a precaution in case of engine failure

or an hour the airport is dominated by the belicopters
—not the high pitched whine
of jet engines, but the furious
thrash of rotor blades. his is, in fact, the world's lar-

gest heliport—a place where visitors quickly sense the daily excitement of the off-shore oil industry and the air services that back it all up. The mix of helicopters and yet planes is not an easy situation for a busy airport—the third busiest in Britain, in terms of air transport movements. is an extra load on air traffic controllers who co-ordinate landings between aircraft

landing at the near walking

reginatore.

pace of a belicopter to the speed of jets. Helicopter graffic in March was up by more than 50 per cent compared with the same time last year. Much of this has been due to the replacement of fixed-wing aircraft by long range helicopters to reach dis-tant fields. Previously, fixedsunburgh Airport at the southern tip of the Shetland Islands where helicopters would then take them to off-

shore oil rigs.

Long range helicopters, such as
the Chinooks, Sikorsky S76s
and Super Pumas can now
make the trip from Aberdeen.

Traffic level

Helicopter passenger traffic has reached over 400,000 a year as part of the 1.6m passing

through the airport. Mr Vernon Murphy, the general manager of the airport, points to the peculiarities of Dyce airport at Aberdeen. It serves a very small catchment area of around 350,000 to 400,000 people, a fraction compared to the millions within the reach of Heathrow or Gatwick. This means that most of the

passengers flying in to Aber-

deen live elsewhere.

The airport is the busy hub of the North Sea air communication increase in holiday traffic out tions for five days a week. Then, over the weekend, all goes quiet and it again becomes the regional airport

serving a small city.

London is still a prime destination for passengers. British Airways have a TriStar, the first wide-bodied jet to use the Despite an active programme of improvements such as radar airport, to cope with some of the pressure on flights. Dan-Air and the smaller com-muter services within Scot-land and the British Isles, such as Air Ecoses, Loganzir,

Access to the sirport by road from the city is very poor with 30-minute journeys not and Air UK use the airport as well as a host of companies

Useful reading for the business visitor

The mix of helicopters and planes is not an easy situation

for Aberdeen Airport—the third busiest airport in Britain, in terms of air transport movements. Above: A British Airways belicopter being prepared for a flight out to offshore oil installations.

nic Beview: A regular survey of the oil and non-oil economic situation, with regular special studies on sub-jects such as the fish processing industry, offshore gas, the regional whisky industry and advance factories.

Issued by: The Department

of Physical Planning, Grampian Regional Council, Woodhill House, Ashgrove Road, West Aberdeen, AB9

• NESDA, Offshore Directhe North-east of Scotland Development Authority for the oil-related industries in the Aberdeen area.
Issued by: NESDA, 57
Queens Road, Aberdeen, AB1

 Oil and Gas: Future impact upon Grampian region: papers from a symposium organised by Grampian local authorities and the UK Off-shore Operators' Association

Issued by: Grampian Regional Council, Department of Physical Planning (address

Oil and gas-related prospects in Grampian (1982 update).

of the airport—a nearly 30 per cent rise over the year

from seven to 11 flights per week. Most of these are pack-

age heliday flights to Spain.

assisted landing facilities on the main 6,000 foot runway

and adjacent helicopter strip, there is still some feeling that

uncommon through dense

things could improve.

Issued by Grampian Regional Council, Department of Physical Planning (address above).

Skilled Manpower Needs

in the Grampiau Region: A detailed study of the type of labour requirements for the area in the future. Issued by: Manuower Services Commission, Training Division, Office for Scotland, 9 St Andrews Square, Edinburgh.

Scotland: Petroleum

Annual: an extensive list of offshore activities and onshore facilities,
Issued by: Aberdeen
Petroleum Publishing Ltd, 37
Huntly Street, Aberdeen AB1

• Scotland: the oil and gas Scottann: the on and gas-future: a survey of the pros-pects for the industry surveyed by the Scottish Development Agency. Issued by Scottish Develop-ment Agency: 120 Bothweil Street, Glasgow G2 7JP.



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Work has now begun on Aberdeen's ninth offshore support base

Harbour Board strengthens facilities

ABERDEEN HARBOUR is at the heart of the North Sea oil business. And it is here that the pulse of North Sea activity can be taken,

The discovery of oil has totally transformed the harbour, though a slackening of exploration scrivity has led to an increase in the number of supply boats tied to the quay, waiting for new con-

To handle the supply ships and associated onshore supply industries, the entire harbour has been rebuilt since 1969. The lock gates had to be dismantied and the quays rebuilt to allow the boats 24-hour access—there can be no question of a boat waiting for the tide in an industry where time is money. Earlier this month, the Aberdeen Harbour Board opened its eighth off-shore support base at Poera Quay and simultaneously announced the start of Today, Amoco, Chevron, Shell, Texaco and Total have leased their own quay facilities. Two other quays are owned by Seaforth Maritime and the John Wood group, two supply companies offering offshore operators "one-stop-shopping" for supplies, rauging from drillpipes to hamburgers.

Public quays handle further traffic for independent operators. Oil activity now accounts for about half the harbour's revence in terms of

dues on ships and goods. A three-month overtime han by regis-tered dockers at the start of 1982 dented tered dockers at the starf of 1982 dented the harbour's overall operating surplus from £2.4m in 1981, to £1.4m last year. Now a long-term agreement for dockers, lasting into 1985, has increased the prospects for greater industrial stability. Alongside the supply boats ealling past the breakwaters come the fishingboats. The city has a fleet of 45 vessels, 23 of them trawler. But this is a shadow of what the harbour was in the past. In 1980 the amount of fish landed at Aber-deen was the lowest since 1898. Tonnage has increased to a current level of 44.981 tonnes.

The introduction of the National Dock Labour Scieme led to a gradual exodus of fishing vessels to other ports, such as Peterhead, where the scheme was not But Aberdeen is still the largest fish market in Scotland and the place where

70 per cent of the fish processing is carried out.
Improved handling and a new fish market has sen the start of a slow return of fishing traffic to Aberdeen.

A recent study by the Sea Fish Industry Authority noted that today, on balance, Aberdsen has certain marginal advantages over Peterhead—a port to land fish.

ment in demersal fish—mostly haddock
—are landed at these ports.

The report pointed out that while
landing costs can be 30 to 33 per ceot
higher in Aberdeen, the fish usually

higher in Aberdeen, the fish usually fetch a better price.

It noted the practice of overfilling boxes prevalled in Peterhead, but not Aberdeen, a further advantage for fishermen who could lose op to £16,000 a year through this practice in Peterhead. General cargo also accounts of a sizable amount of activity at the port, and, currently, new cranes are being installed to improve grain and other bulk cargo handling.

Mr John Turner, the general manager of the port has been hunting a European farry link for the international roro terminal in the port. Aberdeen is already the base harbour for sea links between the mainland and Orkney and Shetland.



with its fleet of 45 fishing vessels, has the largest market for fish in Scotland. It is the country's main fish processing centre

BUSINESS CONTACTS

work on the ninth.

YATSUCIA

Major Industr

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armen: 1991

s than era

" of Pages

and telephone numbers in Aberdeen include the follow-

Grampian Regional Coun-Grampian Regional Council, Department of Physical Planning; Mr Trever Sprett, Director; tel. (6224) 682222.

The North-East Scotland Development Authority (NESDA); Mr Gordon Sampson, Director; tel. (6224) 64222.

 Aberdeen District Council, Department of Develop-ment and Tourism; Mr Gordon Henry, Director; tel. (0224) 642121.

Aberdoen Harbeur Board; Mr John Turner, General Manager; tel. (9224)

 Aberdeen Airport; tel. (0224) 722331.

OFFSHORE EUROPE

MORE THAN 20,000 visitors MORE THAN 20,000 visitors from around the world are expected at this year's Offshore Europe exhibition at Aberdeen.

The event (from September 6-9) will be held in a specially-erected seven-acre exhibition hall and will be opened by Mr. Nigel Lawson, the Energy Secretary.

Offshore Europe '83 has attracted more than 700 exhibi-tors from such countries as Canada, Denmark, Finland, France, West Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the



The European Cap comes to Aberdeen: Lord Provost Collie The European Cop comes to Aberdeen: Lott Provot Coline appears on the flag draped balcony of the Town Hall in Union Street, Aberdeen, to cheer the triumphant soccer team after its return from Gothenburg, Sweden, following the recent 2-1 victory over Real Madrid. Jubilant fans lined the 10-mile route from the zirport.

Traditional industries take a battering

OIL has not blessed every quarter of jobs in the food corner of Aberdeen. This vast industry and one-fifth of industry has, over the past decade, overwhelmed a small textile employment had gone.

The report noted that the traditionally served its rural

While bringing a prosperity unheralded in the city's history, Aberdeen's traditional industries have taken a battering industries such as fish processing, paper textiles and engineer-ing which all pre-dated the discovery of oil.

Oil has imposed a dual economy on the city in terms of wages, labour and costs - one for the offshore industry and one for traditional industries. Companies found large segments of their skilled staff lured away to better-paid

A recent study has shown that in many cases Aberdeen's manufacturing sector has been hit harder than that of other

populated areas of the region, improvements and opportuni-industrial body blows hurt ties for new growth. It coun-more when there are fewer selled the city and regional alternatives for employment councils to develop a programme

textile employment had gone.
The report noted that the recession had hit manufacturing most heavily. Three-quarters of all redundancies in 1978 occurred in manufacturing, although this sector only accounted for one-fifth of the

Argument

At the core of the argument put by Grampian region, which includes Aberdeen, against the loss last year of assisted area status was the damage this would have on the non-oil

The Government's decision to remove this classification with because of the relative benefit brought by oil is now a disincentive for inward inve in manufacturing for Aberdeen. The picture, bowever, has The manufacturing sector not been one of all-pervading shrank by nearly 20 per cent gloom. The Begg McDowall from 1977 and 1981. As with industry in other less heavily populated areas of the resonant implications and nainted and industry in other less heavily populated areas of the resonant implications.

Changing patterns in employment Change 1971-77 Manufacturing Total 99.229 119,817 38,361 178,524 - 1,128 +27,543 Total 150,981 +18.2Manufacturing Total 669,000 615,000 2,003,000 2,071,000 Source: Annual Census of Employment

No account is taken ni these figures of the self-employed or of the armed forces

	Comparisons	of manu	facturing	trends	in Scottish	cities	
	Em	ployment ((2006)	Chang	e 1977-81	Change	1979-81
	1977	1979	1981	No.	%	No.	%
Aberdeen	21.7	21.0	17.1	- 4.6	-21.2	- 3.9	-18.6
Dundes	30.9	30.1	24.7	- 6.2	-20.1	- 5.4	-17.9
Glasgow	110.3	104.1	84.4	-25.9	-23.5	-19.7	-18.9
Edinburgh	34.8	35.3	31.5	- 2.2	- 9.5	- 3.8	-10.8
Source: SCOM	DER.						

promote fish, may offer this Stoneywood Mill on the fringes central theme of UK industria sector a better future.

Textiles have gone through a period of contraction and no development, according to the areas of microelectronics industrial body blows hurt ties for new growth. It counmore when there are fewer alternatives for employment than in large cities.

A study of the non-oil industry was published last month by Prof Hugh Begg and Mr Stuart McDowall.*

Between 1977 and 1981, one- ties for new growth. It counperiod of contraction and no development, according to the report, should be in small companies, value-added products—of the areas of microelectronics report, should be in small companies, value-added products—of the distance from markets and rising costs.

The common fishing policy of the products with good of the fish processing industry was published last modernising their plant at the report underlined a council.

The common fishing policy of the products with good of the fish processing industry was drawn activities and floating to the areas of microelectronics of the areas of microelectronics of the offshore industry.

Since the report was drawn activities of the offshore industry; study by H. M. Begg and further plant at the report underlined a council.

In 1728 The Royal Bank of Scotland did something that seemed very un-Scottish. It introduced the 'cash-credit', a business loan for 'merchants of good standing'.

No Scottish invention since has done so much to stimulate production. (Neither the

The Original Stimulant and other perks for Industry. rotative steam engine, nor television,

not even the coffee percolator!) And nothing nowadays seems more

Scottish than commercial investment.

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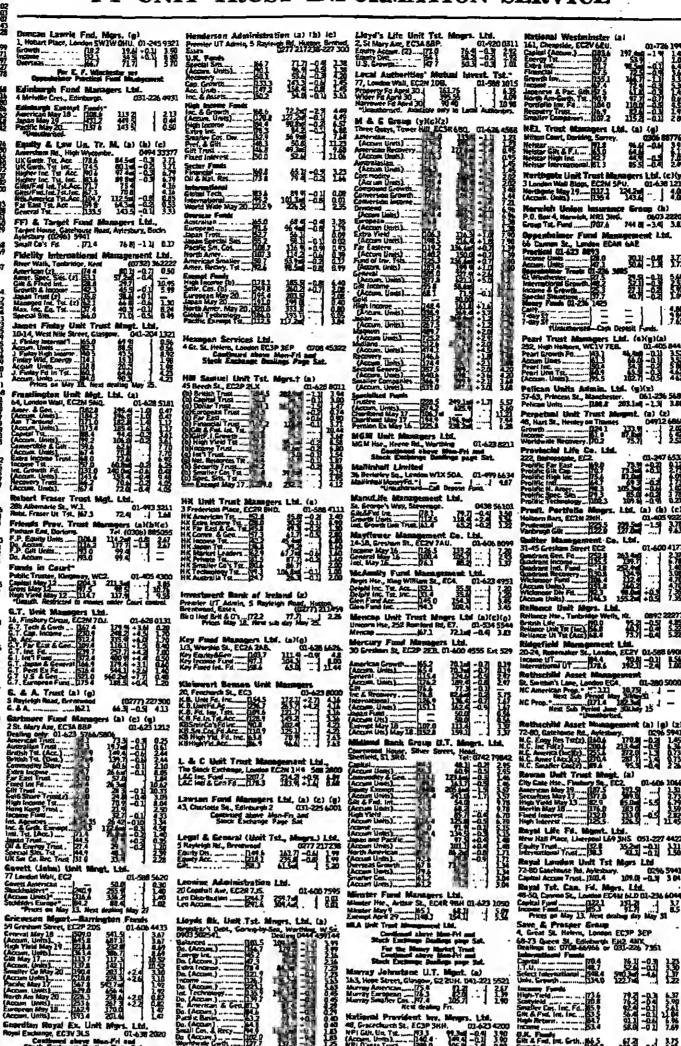
Locate in Scotland.

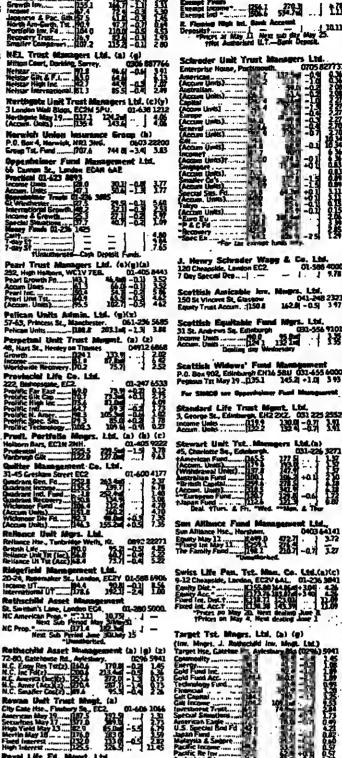
It could be the best idea you've ever had.

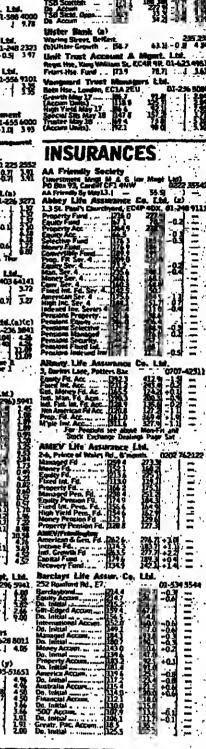
The cona-type coffee percolator was invented by Scottish marine engineer Robert Napier in 1840.

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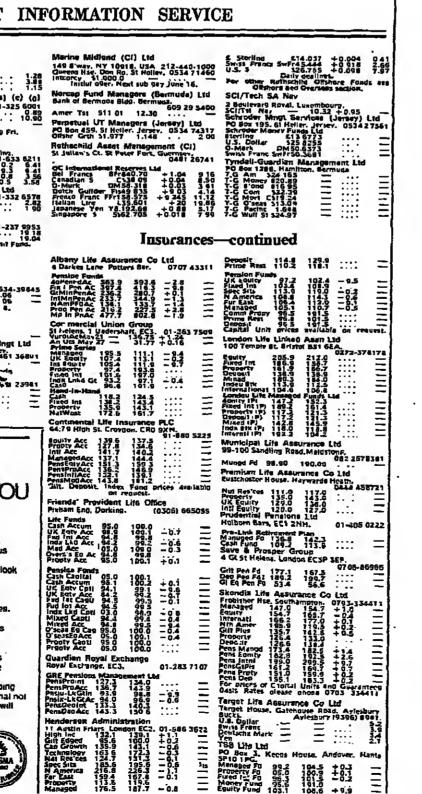
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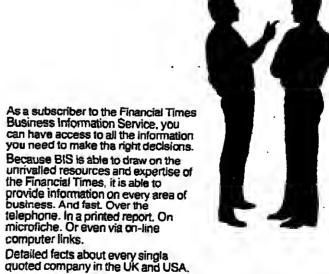
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CURRENCIES, MONEY and CAPITAL MARKETS

FOREIGN EXCHANGES =

Dollar strong on money supply fears

BY COLIN MILLHAM

The unexpectedly sharp rise in two of the three monetary aggregates published on May 13 followed earlier evidence of inbut retreated on Friday followcreased U.S. economic growth, ing a sharp drop in the April
and dashed hopes of a reduction French trade deficit to FFr
in the Federal Reserve discount 1.54bn from FFr 6.58bn in
rate before the Williamsburg March.

Summit.

After a peak of FFr 7.4475

Mr Paul Volcker, chairman of the Federal Reserve Board added to the general gloom about interest rates when be suggested 7.36 the previous Friday. The that lower rates require a lower highest point touched against the LS, budget deficit which many the D-mark on Thursday was to the general gloom about in-terest rates when be suggested that lower rates require a lower U.S. budget deficit, which many

to prevent the U.S. currency rising to a 14-month high in Frankfurt on Thursday. It also climbed to e record levol against the French franc on the same day, but retreated on Friday follow-

EMS EUROPEAN CURRENCY UNIT RATES

	ecu central rates	Currency amounts against ECU May 20	% change from central rate	% change adjusted for divergence	Divergence
Beiglas Franc	44.9008	45.2217	+0.71	+0.50	+1.5447
Benish Krone	8.14104	8.08486	-0.69	-0.50	+1.6425
Germaa 11-Mark	2.24184	2.20632	+1.05	+0.84	+7.0642
French Franc	8.67456	6.80281	-1.04	-1.25	+1.4652
Dutch Gullder	2,52595	2.54396	+0.71	+0.50	+1.4964
triate Punt	0.72568	0.716877	-1.21	-1.42	#1.8899
Italian Lim	1403,49	1347.46	-3.99	-3.99	±4.1505
Change		ECII shandan	mantalus abs	descree	

week currency. Adjustment celculated by Financial Times. OTHER CURRENCIES

May 20	!			£
112, 20				Note Rates
Argentina Peso	1 '2,588-128,780	78,840-78,890	Austria	28,25-27,25
Australia Dollar	7625-1.7645	1.1305-1.1330	Belgium	70,55-77,20
Brazil Cruzeiro	784,50-787,50	471.93-474.28	Denmark	13,67-13.80
inland Markke_			France	11,69-11,62
reek Drachma			Germany	3,8114-3,801
long Kong Dollar	10,71-10,77	8.88-0.01	italy	2905-2295
ran Rial	139,60*	84_90*	Japan	363-368
(uwaltDinar(KD)	0.4510-0.4510	0.2210-0,2215	Netherlands	4.504.4.84
uxembourg Fr	76.82-76.92		Norway	11.00 11.10
dalaysia Dollar.	3.0750-3.5860		Portugal	147-156
lew Zealand Oir J			Spain	2024-217
audi Arab. Riyat			Sweden.,	11.63-11.73
ingapore Dollar			Switzerland	3.20-8.23
h. African Rand	1.6805 1.6820	1.0800.1,0810	United States	1,5419-1,561
J.A'E. Dirham	e.7090-5.7160 ,	8.6720-3,6785	Yugoslavia	180 138

THE POUND SPOT AND FORWARD

May 20	Day'e spread	Close	One month	% p.e.	Three	p.a
U.S.	1.5546-1.5606	1.5556-1.5565	0.20-0.15c pm	1.35	0.45-0.40 pm	1.0
Canada	1,9130-1,9190	1,9165-1,9175	0.20-0.10c pm	0.34	0.46-0.36 pn	0.8
Neihlad.	4.20-4.34	4.324-4.334	2-11-c pro	4.85	5-4's pm	4.3
Belgium	76.75-77.00	76.82-76.92	Sc pro-2 dis	0.47	4 pm-6 dle	~0.0
Ognmark	13.71-12.764	13.75%-13.76%	24-12-om om	1,90	14-3 pm	0.2
basiant	1.2160-1.2200	1.2185-1.2195	0.43-0.550 dis	-4,82	1.23-1.44dia	-4.30
W. Ger.	3.831-3.86	3.843-3.853	23-13pt pm	5.84	51-414 pm	5.19
Portugal	151.00-157.00	154-26-155.26	370-1540c dia		735-2300dia	-39.2
Spain	214.80-216-20	210.25-215.45	220-300c dis			-14.07
taly	2285-2295	2287-2289	81-101 lire die		31-34 dia	-5.6
Horwey	11.08-11.12	71,105-11.115		-2.91	9-10- dis	-2.4
rance	11-55-11.58	11.56 - 11.56 -	2-3c die		9-105 dis	-3.3
Swedan	11.64-11.67	11.651,-11.661,	1-11-ore dis		23-34 die	-0.94
lepen	362-365	3631-3641	1,35-1,16y pm		3.60-3.40 pm	
Austria	27.00-27.20	27,10-27,15	14%-13pro pm		384-34's Dec	
Switz	3.20-3.24	3.224-3.234	1%-1%c pm		Pa-4's pm	5.73
	Belgisn rate ie	for convertible	froncs, Financia	fraug 7	76.95-77.05.	
	Six-month fores	erd deller 0.79	0.74a pm. 12-ma	oth 1.37	.1 17c am	

Foreign exchanges were not observers felt underlined the particularly active last week, but trading tended to be all one the discount rate.

As the dollar advanced, the dollar on fears that Friday's German Bundesbank intervened to support the D-mark, but failed be as disappointing as the previous week's.

The unexpectedly sharp rise

observers felt underlined the around the DM 2.48 level, before closing on Friday at DM 2.4753, year rise of 4 per cent against compared with DM 2.440 at the end of the previous week. In the discount rate,

As the dollar advanced, the dollar one supply figures would be as disappointing as the previous week's.

SwFr 2.0240, and against the strong dollar, but provided the provious week's.

The unexpectedly sharp rise Y231.90. pound lost 1.10 cents to \$1.5560 against the strong dollar, but improved to DM 3.8550 from DM conservative lead in the run up 3.8525; to FFr 11.5650 from FFr to the general election beloed to underpin sterling, which also 3.1750; and to Y364.50 from gained a little support from the y363.50.

FORWARD RATES AGAINST STERLING

BANK OF ENGLAND TREASURY BILL TENDER £100m 0,78683 8.8191% 10.07% 9.7471%

287,545 £97.560 I £100m £100m at next to **CURRENCY RATES CURRENCY MOVEMENTS** Change 2 Sterling U.S. 8 84.1 122.7 90.8 120.0 03.5 83.0 120.0 150.5 117.7 69.9 01.5 148.0 Beesd os trade weighted changes from Washington agreement Oscember 1971,

THE DOLLAR SPOT AND FORWARD

May 20	Day'e spread	Close	One monthi	% p.a.	Three months	7. p.a.
UKt	1.5645-1.5606	1,5566-1,5566	0.20-0.15c pm	1.36	0.45-0.40 pm	1.00
Irelandt	1.2790-1.2775	1.2750-1.2760	0.60-0.50c pm	5.17	1.63-1.46 per	4.50
Ceasde	1,2310-1,2325	1.2310-1.2315	0.03-0.05c dia	-0.44	0.06-0.08dls	-0.2
NethInd.	2,7756-2,7830	2.7810-2.7830	0.87-0.77¢ pm		2.35-2.25 pm	
Belolum	49.37-49.46	49,40-49,42	3-4'ye dis		10-13 die	-0.83
Danmark	8.8240-8.8470	8.8270-6.8470	hore am-h die			-0.11
W. Ger.	2.4705-2.4795	2.4760-2.4770	0.95-0.90of pm		2.82-2.57 pm	
Portugal	88.50-89.70	89-20-89.70	250-1000c dis		500-1500dis	
Opein	138,10-138,50	138.30-138.40	150-180c dia		470-540dia -	
Viesi	14691-14731-	14691-14701	7-14 line die			
Norway	7.1290-7.1450	7.1350-7.1450	2.80-3.30ore dis		7-80-8-30dis	
Fmnce	7,4250-7,4390	7.AZ75-7.4325	2.40-2.55c dia		8.20-8.60dis	
Sweden	7.4920-7.4980	7.4920-7.4970	1.10-1.60ors dis		3.40-3.90die	
Jepan	233,40-234,06	233.45-233.95	0.58-0.53v pm		1.69-1.51 pm	
Auetria	17.401-17.44		7.40-6.80gro pm		20.50-18.00pa	
Switz.	2.0620-2.0765		0.85-0.80c pro		2.38-2.33 Pm	
† UK	and Ireland a	the U.S. delle	J.S. currency. F	prward e indivi-	pramiums an	d

EXCHANGE CROSS RATES

May. 20	Pound Strling	U.S. Dollar	Deutschem's	JapaneseYen	FrenchFranc	Swiss Franc	Outch Gulld	Italian Lira	Canada Dollar	Beiglan Franc
Pound Sterling U.S. Dollar	0,648	1,656	3,853	364.0 238.9	11.56 7.429	3,228 · 9,074	4,898 	9288. 1470. ··	1.917 -1.258 ·	76.87 49.40
Deutschmark	0,260	0.404	1.	94.46	5.001	0,888	1,125	593.9	0,498	19,96
Japanese Yen 1,000	3,747	4.275	10,58	1000,	21,76	2,867		8286,	5,256	211,2
French Franc 10	0,865	1.346	5.333	314.0	10,	e,792	5,744	1979.	1.668	56,50
Swiss Franc	0,310	0.482	1,194	112.6	3,589		1,341	708.9	0,594	23,82
Dutch Gulider	0,231	0,860	0.890	84,11	9,671	0.746	1.891	028,7	0.443	17.76
Italian Lira 1,000	0,437	0,680	1.684	109,1	5,069	1,411		1000.	0,838	35,60
Canadian Dollar	0.028	0.512	9.010	189.9	2.030	1,684	9,267	1194.	2,494	40,10
Beigizn Franc 100	1.301	8.024	0,018	473.0	10,04	4,109	0,630	2978.		100.

MONEY MARKETS

Almost grinding to a halt

Interest rates had a slightly firmer tone on the London money market last week, but this was mainly a defonsive reaction to the uncertainty generated on both sides of the Atlantic.

A large lead for the Conservatives in the opinion polls soothed the market for most of the week, but with about three weeks still to go to polling day, there was no enthusiasm to look very far shead, and interest rates settled down to a general blanket lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ per cent. The gentle reverse yield curve, which has been a market lovel of around 10½ lovel lov

confidence may have been at a higher level if the occommic statistics from the U.S., including money supply figures, had been less disconcerting. Signs of an upturn in U.S. economic activity alone, may not have slarmed the market. Providing this was not accompanied by signs of overheating there was every reason to hope that the U.S. Administration would be keen to reduce interest rates ahead of the Williamsburg Summit.

Soeculation increased that the

Speculation increased that the Federal Reservo discount rate would be cut, but as on previous

London's financial markets almost ground to a bait against a background of political nervousness in the UK and uncertainty about monetary policy in the U.S. The money market was flat, gilts becalmed, while on the London International Financial Futures Exchange, dealers spoke of stalemate. Activity bald at

May 20 1983	Sterling Certificate of deposit	Interbank	Authority deposits	Local Auth. negotiable bonds	Finance House Deposits	Company	Discount Market Deposits	Treasury Bills &	Bank Bills &	Fine Trade Bills 6
Overnight		0.11	104-104	1 -		1012	84-104	_	_	
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7 days er			_	- 1		-	! —	- 1	- I	_
7 days notice	i — —	104-104	104			1012	10-101	_	— i	_
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Two months		104 104	104	104-104	10%	105	978	94	O+k	10.4
Three months.		104 10	104	1055-104	10%	105	94.97	98 978	029	10-6
Six months		104-104	104	101g-101g	101	_	_		913-934 Oth	101
hine months		104.10	10%	1058-104	10%	_	_		- 1	
Dne year	10 -101	104-1012	204	104 104	101	1	i 1	i — 1	- I	_
Two years		_	1078		_	1 -		1	~	_

ECGO Rate Export Finance Scheme IV Average Rate for interest period April 8 to May 3 1983 (inclusive): 10,204 Cent.

Acgroximate sening rate for one month Treasury bills 9^{10}_{22} -10 per cent two menths 9^{10}_{23} -9 $^{10}_{22}$ per cent; three menths 9^{1}_{23} -9 $^{10}_{23}$ per cent; three menths 9^{1}_{23} -9 $^{10}_{23}$ -95-64ths per cent; trade bills one month 10^{10}_{23} per cent two months 10^{10}_{23} per cent end three months 10^{10}_{23} per cent; trade bills one month 10^{10}_{23} per cent; two months 10^{10}_{23} per cent end three months 10^{10}_{23} per cent.

Figure 4 Notice 3 See Rates (qublished by the Finance Houses Association) 11 per cent from May 1 1963, London and Scottleth Clearing Seak Rates for lending 10 per cent, London Opposit Rates for sums at seven days' notice 6^{10}_{23} per cent. ceat.

Treasury Bills: Average tender rates at discount 8.6191 per cent. Certificates of Tex Deposits (Series 0). Deposits of £100,000 and over held one month 10% per cent one-three months 10% per cent three-six months 10% per cent siz-12 menths 10% per cent. Under £100,000 10 per cent from April 6. Deposits held under Saries 3-5 10% per cent. The mites far all deposits withdrawn for cesh 8 per cent.

INTEREST RATES

EURO-CURRENCY INTEREST RATES (Market closing rates)

May 20	Short term	7 days notice	Month	Three Months	, Bix Months	One
Sterling	104 t04	104 104	104-104	10 2 10%	10 - 10 -	104 10
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S. Franc	24.3	8 812	458-454	41141	4:44	444
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Fr'nch Franc	124-124	184 184	184-18-	1859-1374	10 101	174-17
	14-151	14 18 18	16.18s	184 104	17-174	184 12
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FT LONDON INTERBANK FIXING

(11.00 a.m. MAY 201								
3 month V.	8. dollars	e months	U.S. dollars					
bid Sife	offer 8 1/4	ыс 81/4	offer 956					

The fitting rates are the arithmetic means, rounded to the nearest one-abteenth, of the bid and offered rates for \$10m quoted by the market to five reference banks at 11 am each working day. The banks era Nadoral Westminster Bank, Benk of Tokyo, Deutsche Benk, Benque Nationale de Peris and Morgan Guaranty Trust.

MONEY RATES NEW YORK

GERMANY

FRANCE JAPAN

SWITZERLAND Original Color Col

NETHERLANDS \$ CERTIFICATES OF DEPOSIT LONG TERM EURO \$ SOR LINKED DEPOSITS

ECU LINKED DEPOSITS

U.S. TREASURY BILLS (RAMA) Sim points of 100% 19,30 revious day's open int. 3.558 (3,569) D-YEAR 12% MOTIONAL GILT 50,000 32rds of 100% Prev 104-02 103-24 105-12 105-00 104-22 CERT. DEPOSIT (IMMI) 51m points of 100% STERLING E25.000 8 per £ THREE-MONTH EURODOLLAR (IMM) 90.67 90.40 90,17 90.81 90.39 90.17 Close 1,5540 1,5495 1,5470 1,5480 WISS FRANCS SWF 125,000 ne 16 (67) LAPANESE YEN Y12.5m \$ per Y100 High Low 0.4298 0.4277 WEEKLY CHANGE IN WORLD INTEREST RATES

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Financial futures •

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U.S. TREASURY BONDS (CBT) \$100,000 32nds of 100%

LONDON

TOKYO

One month Bills Three month Bills

AMSTERDAM One month Three month

THREE MONTH SURODOLLAR STro paints of 100%

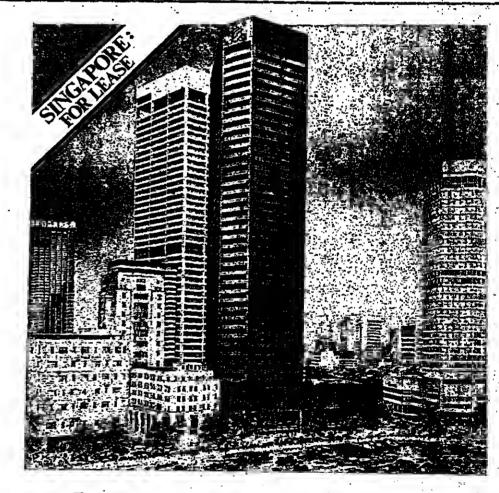
Mechanical Engineering, Laboratory Instrum Technological Services for Construction and Industry. Key points from Mr Philip Beck's statement to shareholders * Pre-tax profits of £8.5m compared with £7.8m for the previous year * Dividends increased by 9.1% to 10.5p per share * UK construction had a successful year and the Group is participating strongly in road building and in civil engineering generally. * Property Division was awarded the redevelopment of Bath Spa. * Work progresses on Diego Garcia; trading conditions in East Africa remain difficult. ★Since the year end, the Group has acquired Buehler a US specialist testing equipment business. * The work load at end March 1983 stood at

£245 million and is stable.

the Group's prospects with confidence. 1981 1982 Summary of Results £m £m 293.0 271.0 Turnover 8.5 7.8 Profit before tax Profit after tax and extraordinary items 5.6 6.1 49.0 44.5 Shareholders' Funds 28.3p 34.5p Earnings per share Dividends per share (net) 10.5p 9.625p Shareholders' funds per share 248p .225p Copies of the Annual Report, containing the Chairman's Statement in full, are available from The Secretary Westgate House, Ealing Road, Brentford, Middlesex TW8 0QZ.

* Forecasting remains difficult but the directors view

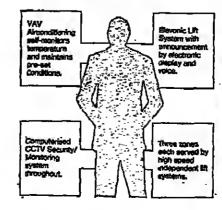
John Mowlem & Company PLC The stridged 1982 results reflect the unqualified audited accounts that will be filed with the Registrar of Companies.



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SECTION III

FINANCIAL TIMES SURVEY

EROSPAC

The recession has severely depressed commercial airliner sales, but other areas of world aerospace, such as military and space activities, have remained remarkably buoyant. The overall outlook is for business worth over \$500bn. throughout the next decade

Waiting for the world recovery

BY MICHAEL DONNE, **AEROSPACE** CORRESPONDENT

THE WORLD'S aerospace industries go to the Paris Inter-national Air Show this week hopeful that the signs of an improvement in the world economic situation in recent weeks do indeed presage a recovery in their own fortunes.

Although the serospace community as a whole has weathered the recession better than many other industries, it has still suffered severely, especially in civil airliner and engine manufacturers have passed through the worst two to three

Activity in the military airvity has stemmed more from rate was 700 to 800 aircraft a the continuation of major pro- year. grammes (such as the Tornado The effects have been trau-multi-role combat aircraft in matic, with labour lay-offs run-Western Europe) begun before ming through the entire aerothe recession struck, than from space industry, through to the
new programmes subsequently initiated.

multiplication layout
Moreover, even the military industries. These cuts have been

market has been characterised especially severe in the aero-by a marked intensification of engine industry, and again "toird-level" aviation category. competition for the few new especially in Rolls-Royce, where orders prevailing, and this situ-the redundancies continue, with agree that once the recession is

There is little doubt that in many companies in the U.S. and Western Europe where both civil airliner and military aircraft manufacture are undertaken, the profits earned on the military side have been supporting the civil operations. This seems likely to continue, at least until demand for commercial aircraft has recovered sufficiently to enable airliner.

There is little doubt that in 1981 and 1982, But despite the difficulties of the past two to three years, and the probability that the inflowed resulting the probability that the inflowed re sufficiently to enable airliner production to stand on its own feet again.

feet again.

At the same time, the space sector has been developing rapidly, with rising demand for satellites of all kinds, but especially for telecommunications (including direct broadcasting), weather forecasting and Earth resources monitoring and Earth resources monitoring —tha three big areas of space expansion. Demand for satellites and their supporting ground installations is forecast to amount to between \$20bn and \$30bn, up to the end of this

years in their history. During 1982, the total of new jet aircraft sector has remained more liners of all kinds ordered buoyant, stimulated by con-tinued demand for combat air-craft, engines and guided mis-siles in many countries, particu-larly in the Developing World. a third of the total ordered in Even here, however, the acti-tive here, however, the acti-tive here streamed means from the stream than the stream

ation shows no signs of dimin-ishing. another 6,000 due to be laid off this year, on top of those laid. There is little doubt that in off in 1981 and 1982,

Demand

Airbus Industrie, the European airliner manufacturing group in which British Aerospar, has a 20 per cent stake, believes that the total market for new jat airliners between now and the end of this century is likely to amount to 6,700 aircraft, worth about \$275bn. Airbus aims to win about 34 per cent of this market, or over \$90bn worth of Boeing of the U.S.

aircraft between now and 1995, although it does not put a cash value on that figure.

includes smaller transports in the 1980s.

over, a major upsurge in demand for civil aircraft will

emerge. It will stem not only from a revival of traffic growth (with an annual average in-crease of about 6 per cent) but also from the need to replace existing ageing and fuel-inefficient fleets, while new noise regulations becoming effective in about 1985-86 in the U.S. and Western Europe, including the UK, will render obsolete some older jets, requiring new orders as a matter of urgancy in some

countries.

Even if the manufacturers' forecasts prove to have been over-optimistic, it does seem likely that the world's aerospace industries will face a substan-tial volume of business through the rest of this decade and through to the end of the century.

cast of \$167bn worth of "front-line" airliner business, it is estimated that demand for civil the and military helicopters could world's biggest jet airliner amount to some \$366n over the manufacturer, believes that years ahead. To this should be between 1983 and 1995, there added the possibility of at least will be a demand for about some \$20bn of new business sume \$20bn of new business over tha next decade in the "general aviation" category Uner building division of aircraft outside the airliner and McDonnell Douglas of the U.S. believes that the world's aircraft outside the including band believes the world's aircraf believes that the world's air-ness aircraft and private and lines will need about 5,000 new leisure demands). together with at least another \$15bn for "commuter airliners."

The U.S. General Aviation On the engine side, Pratt & Manufacturers' Association be-whitney is even more opti-lieves that forecast increases in mistic, believing that total U.S. Gross National Product, demand for airliners of all corporate spending and cor-kinds could reach as high as 10,000 by the end of the promise a rising trend of busi-century, although this figure ness that will continue through

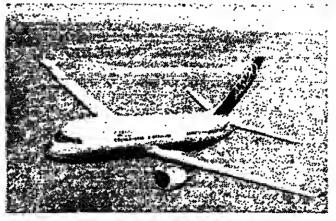
volume of aircraft and engine business through the 1980s could amount to well over \$230hn, and this figure might prove to be conservative if the recovery from the recession is swifter and stronger than many currently dare hope.

If to this is added space business, a collective volume of over \$250bn of commercial aerospace business worldwide seems not unreasonable during the coming decade, Military business, foreeast to run at anything between \$25bn and \$30bn a year through the next decade, or a total of up to \$250bn \$300bn, means that overall the world's aero-space industries can expect business of over \$500bn through the next decade.

Redundancies

The manufacturers' main problem is that they have to survive over the next year or two — a period of lower production activity reflecting the low level of orders of recent years. New orders booked either this year or next are not likely to be reflected on pro-duction lines until late 1984 or early 1985, unless empty slots have been left specifically for that purpose, and there may even have to be further redundancies in the manufacturing industry later this year.

One of the major outstanding decisions in the commercial sir-liner field is whether or not any one, or all, of the major m facturers will formally launch soon the development of a new, so-called "150-seater" jet air-liner, for service from the late 1980s. All the major companies have been undertaking studies Boeing with its "7 Dash 7,"
737-400 and short-uselage 757
concepts, Airbus Industrie with



Two prospective new international projects seem likely to deminate the European aerospace industry through the rest of this century. One is the A-320 150-seater version of the European Airbus (above). The other is the advanced Agile Combat Aircraft (ACA) (below) for which a "technology demonstrator," called the Experimental Aircraft Project (EAP), is to be built



the A-320, and McDonnell Donglas with its D-3300-1—and combined research and develop-ment spending on these designs now probably runs well over

If Airbus Industrie were to formally launch the A-320 this year, Boeing would probably immediately counter with its 737-400, which it believes it could put into the market by 1987, heating Airbus, and at a

heaper price.
A similar situation exists with the engine. So far, the earliest available engine would be the Franco-U.S. (General Electric-Snecma) CFM-56 in its Dash 4 version, which Airbus is already discussing for its A-320, while Boeing would also use it in the

(Ishikawajima-Harima Industries, Kawasaki Industries and Mitsubishi Heavy Industries) along with Motoren und Turbinen Union of West

engine, which will cost upwards of \$1.5bn to develop, certificated difficulties over the anti-trust laws, the starting date could slip, putting the engine back to 1988-89 or even later. Many believe that this would be a more realistic target date, anyway. again because of the need for a

Roeing would also use

737-400.

This would be available earRer than the all-new, advanced
technology engine for the new
is now being planned by Rollsia now be frame would then be able to come together for the early 1990s, when overall economic conditions would be likely to be more favourable for the plac-

of the world's airlines. The new engine and new air

Germany and Fiat Aviszione of Italy.
The aim is to get the new

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Westland -technology working.

Westland – technology working to meet the competitive challenges of the world's markets - markets that are becoming progressively more difficult. The Westland response is to make major investment in new product developments.

Westland 30 - Britain's new award-winning civil and military transport helicopter, already in service with British Airways and Airspur of Los Angeles. Westland 30 was financed by the Company and has now been

reinforced by H.M. Government who, accepting its competitive strength, have provided further investment to support the development of derivatives

Lvnx 3 - The newest and most advanced development of the TeamLynx range of military helicopters. A high technology battlefield helicopter with day or night all weather capability.

EH 101 — The product of a a collaborative venture between Westland and = Agusta of Italy. Full development approval by the governments of the U.K. and Italy is expected during 1983 for this anti-submarine, tactical utility and civil helicopter with a world market potential approaching 1,000 helicopters. Development of EH 101 will be funded jointly by industry and government in Britain and

AP 188 - The world's first diesel-powered amphibious hovercraft with a 100 seat civil capacity and high suitability for numerous military roles. Now in passenger service with Hovertravel in U.K., this

cost-effective and low noise hovercraft capitalises on Westland advanced skirt technology and is already the subject of worldwide interest. *

Composite blades – A major advance in the development of helicopter technology. Composite rotor blades will directly replace metal blades, have a much longer life and considerably reduce

maintenance and operating costs.

The initial production # is for the Westland Sea

King but the new blades are applicable to the Sea King

range of helicopters which are in worldwide service from several manufacturers. Westland Aerospace Division is responsible for composite blades business, one of a wide

range of products developed from the Westland technology

Westland

stland Review 82 illustrates technology working across the full range of our activities; if you would like a copy please write to the company.

nd pls Westand Helicopters, British Hovercraft.: Normalair-Garrett and the Westland Technologies Division, comprising Westland Engineers, FPT Industries, Saunders-Roe Developments, Helicopter Services, Westland EMG and Westland-Sitec E.H. Industries (jointly with Agusta of Italy)

Fierce battles in engines market

6 ... the major aeroengine companies are turning increasingly to international collaboration to spread the burden of development costs and so widen the potential market. 9

ALL THREE of the world's major aero-engine builders Rolls-Royce, and General Electric and Pratt & Whitney of the U.S.—have suffered along

look with more confidence to the future.

While over the long-term, the engine builders share their air-frame counterparts' belief that business will expand as world air traffic grows, bringing with it a new demand for airliners of all kinds, civil work-loads for the immediate future seem likely to remain low.

Confident

Despite their problems, all of the big three engine builders remain confident about the long-term future for their industry, despite the current diffculties.

Pratt and Whitney, for example, believes that the air-line industry is heading for another upturn in business through the 1980s. Last year, deliveries of new jet airliners from all sources more believe 1980s. from all sources were below 300, and the excess aircraft capacity currently in the market will continue for souther two years.
But from 1985 on the forecast
is positive, with deliveries rising
to about 500 afroraft a year by
1989, and then continuing at the
500-plus a year level through to
the end of the century.

The airlines, in Pratt and Whitney's view, are likely to need up to 10,000 new aircraft by the year 2000, of which about 4,000 will be needed over the next ten years — comprising 2,400 narrow-bodied jets for short-range work, about 1,200 medium-range wide-bodies and 400 long-range wide-bodies. This will generate a demand for about 25,000 engines by the send of this century, of which close to half (or about 11,600 engines) will be needed by the engines) will be needed by the end of this decade as the chart end of this decade, as the chart

With such a sizesble market, there should be room for all three major manufacturers, but whether all of them can con-tinue to build engines across the wide spectrum of types that are currently on offer or projected remains to be seen. Aeroengine investment is expensive
—any new engine can cost upwards of \$1.5bn to develop, with
the result that, as in ainframes,
the tendency is more towards
derivatives of what is already

financial difficulties of the world's airlines. Over the past two years or more they have been obliged to rely substantially on military business.

There are now signs that some time over the next year or so this situation may change, and that demand for commercial engines will recover sufficiently to enable the manufacturers to look with more confidence to the future.

There are now signs that some time over the next year investments that will be needed future because of the major investments that will be needed in sustain the Rolls-Royce programme across the wide range of its activities.

Rolls-Royce may be described to the difference of the major investments that will be needed in sustain the Rolls-Royce programme across the wide range of its activities.

Rolls-Royce may be described to the major investment in likely to test the courage and stamina of Rolls-Royce may be described to the intendition.

ENGINES AND

Aircraft type

Long range Medium-shert range single aisle

Medium-shert range single aisle

Rolls-Royce managed a marginally higher turnover in 1982 at £1.49bn, but this disguised a substantial fall in available work, stemming from the recession in adding business.

While the company's longerestablished engines, such as the civil Spey jet, Dart turbo-prop, the Viper for business jets, and the Adour for military aircraft remained profitable and substantial busis sees (as did the Pegasus for Harrier vertical take-off aircraft and the RB-199 spread the burden of developfor the Terrago multi-pule comp. for the Tornado multi-role com-bat aircraft), Rolls-Royce was geared to produce in the early 1980s more than 300 large-fan engines of the RB-211 type each

As a result of the recession, estimates have been progres-sively revised downwards, and sively revised downwards, and the latest forecast is that fewer than one quarter of this figure will be produced in 1983. This lack of demand for the large civil engines, and a lower than expected requirement for spares, has reduced inventories and lead times, producing a reduction in work-load and a consequent reduction in employ-ment.

range of engines across the emerge in the mid to late range and payload spectrum, 1980s.
they often have many hundreds This agreement, which fol-

with mo guarantee of profits, even after many years.

Moreover, to try to remain in this business requires a continued injection of new UK means the Government. The Rolls-Royce-Pratt and thinance, on which the return can by no means be guaranteed.

Rolls-Royce's own R and D injection of £131m last year is only one company's outlay for one year. For the aero-engine in-

WORLD COMMERCIAL TURBINE MARKET ENGINES AND SPARE PARTS 1984-93

of millions of pounds at risk lowed many months of negotia-with mo guarantee of profits, tion between the partners, is tion between the partners, is still the subject of approval by

2,850 23.6 7,750 46.5 11,600 69.5

Source: Pratt and Whitney Aircraft (United Technologies) U.S.

fields. In the commercial engine field, Rolls-Royce, with its Dash 535 version of the RB-211, has a head-start over Pratt and Whitney in powering the new Boeing 757 twin-engined short-range jet airliner, but Pratt and Whitney is now emerging rapidly with its PW-2037, which will power Delta Air Lines 757s.

Major rivalry between these Major rivalry between these two companies is likely through the rest of this decade, with these engines, both of which can be expected to be developed further in the battle for orders. Already Rolls-Royce has developed a follow-on version, the SELEA with even further oped a follow-on version, the 535-E4, with even further improved fuel economy over the existing 535C. The E4, with 40,100 lbs thrust at take-off (against the 37,400 lbs thrust for the 535C) is due into airline service next year. U.S. market Non-U.S. mkt. World mkt. \$bn \$hn \$hn \$hn Units 1984 Units 1984 Units 1984

Beyond that, further development of the 535 to higher thrusts are planned for a wide range of airliner applications, including the H4 version of up to 41,500 lbs thrust for future 550 5.0 2,500 20.0 3,050 25.0 1,050 8.0 2,100 14.5 2,150 22.5 2.250 10.0 3,150 12.0 5,400 22.0 developments of the McDonnell Douglas DC-10 trijet (the MD-EEE), and possibly even the Boeing 747 Jumbo jet. Rolls-Royce is gearing much of its future to the 535 engine.

At the upper end of the thrust-scale, Rolls-Royce faces considerable competition with runs to well over film, with no guarantees of profits.

It is for this reason that the major aero-engine companies are turning increasingly to international collaboration to spread the burden of development costs and so widen the potential market.

Rolls-Royce for many years has been involved in international collaboration on a wide range of aero-engine prothe 524 version of the RB-211 from the recently-announced Pratt & Whitney PW-4000 series of engines and from new developments in the General Electric CF6-80 series.

Fuel savings

range of zero-engine programmes, both civil and military, especially with the zeroengine builders in Western The new engine will be based The PW-4000 series of engines is designed to give substantially better fuel consumption over existing "big thrust" engines, together with considerable savtary, especially with the aeroengine builders in Western
Europe, although this has not
prevented the company from
undertaking private-venture
developments in areas where it
the RJ-500 engine will be based
substantially upon technology
developed by Rolls-Royce and
fits three Japanese partners for
the RJ-500 engine programme,
of which two demonstrator
engines have already been ings in maintenance costs stem-ming from fewer working parts. The series will incinde engines between 48,000 ib and 60,000 lb thrust and the first engine will be ready by July 1986.



Pratt and Whitney's PW-2037 engine in altitude test chamber at the company's plant at East Hartford, Conn., U.S. This engine is P and W's answer to the Relis-Royce RB-211-535 in the Boeing 757 airliner.

new version of the RB-211, the series 600, which could have a thrust higher than the 53,000 lh of the D4 version of the RB-211-524 which is about to enter service.

This new version of the RB-211-524 would also be suitable to compete with engines from General Electric, the third of the "big three" in the world aero-engine business. General Electric has established a strong competitive base against Pratt & Whitney in the A-300, A-310 and 747 markets with its CF6-50 series of "big thrust" power-plants.

The overall CF6-50 series of The overall CF6-50 series of engines already powers more than 1,000 aircraft (either in service, on order or on option), and General Electric is now developing its latest variant, the CF6-80C, rated at 56,000 lbs to 62,000 lbs thrust, for centification in June 1985.

Canaral Electric serve this

General Electric says this engine is intended for various commercial applications, including the improved Airbus A-300-600, the stretched upper deck version of the Boeing 747, and stretched derivatives of the 767. General Electric argues that far from being an ensirely new initiative, the Pratt & Whitney PW-4000 series is in effect "a response" by Pratt & Whitney to GE's own CF6-80C. expected requirement for ing adequate rewards.

Potentially one of the most spares, has reduced inventories and lead times, producing a reduction in work-load and a consequent reduction in employment.

This situation illustrates of the U.S. and other acro-engine company, and indeed all major world aero-engine manufac.

Whitney would develop a new engine are very high, often running into millions of pounds, and the first engine will be ready by July 1986.

Aircraft for which it will be suitable will include both current and derivative versions of the Boeing 747, Jumbo, the current and derivative versions of the Boeing 747 Jumbo, the current and derivative versions of the Boeing 767 wide-bodied fwinger of the U.S. and other acro-engine company, and indeed all major turned aero-engine manufactures. The costs of developing industries, Kawasaki Heavy often running into hundreds of millions of pounds, and the first engine will be ready by July 1986.

Aircraft for which it will be suitable will include both current and derivative versions of the Boeing 747 Jumbo, the current and derivative versions of the Boeing 747 Jumbo, the Boeing 767 wide-bodied fwinger of the U.S. and other acro engine companies in Japan Industries, Kawasaki Heavy in the factor of the Boeing 747 Jumbo, the Boeing 767 wide-bodied fwinger of the U.S. and other acro engine of the U.S. and other acro engine companies in Japan Industries, Kawasaki Heavy in the factor of the Boeing 747 Jumbo, the Boeing 767 wide-bodied fwinger of the Boeing 747 Jumbo, the Boeing 767 wide-bodied fwinger of the Boeing 748 Jumbo, the Boeing 767 wide-bodied fwinger of the Boeing 768 with the fact of

Wait for recovery

CONTINUED FROM PREVIOUS PAGE

makes the whole question of Avion de Combat Experimental, timing a matter of vital impor-

On the military side, the major question pelsed over Western Europe is when to launch a new international advanced combat fighter programme, so as to replace by the end of this decade or early in the next the current Jaguar Jet strike-trainers in the RAF and French air force and Phantom jets in the West German Luftwaffe.

Contributions

Currently, the UK Ministry of Defence is helping to finance, with contributions from the in-dustry, the development of a "technology demonstrator," called the Experimental Aircraft Programme (EAP); from which it is hoped eventually will emerge a new advanced Agile Combat Aircraft (ACA). It is also hoped that eventually the development of this sireraft will become an international affair, with the West German industry and perhaps also Italian manufacturers joining in, as they did on the Tornado multi-role combat aircraft.

. The likelihood of the French aerospace industry and air force. a its thrust class.". also participating seems reducte, sub-come since France has already emponent barked on its own advanced tusers.

parties in the engine and equipment industry (Rolls-Royce, Marconi Avionics, Smiths Industries, Dowly Group Ferranti and Lucas Aerospace) have been negotiating with the Ministry of Defence on the detailed contract for the devel-opment of the EAP "technology demonstrator," and a contract is expected to be signed

The Government's confribu-tion is expected to be about \$60m to £70m, covering air-frame, engine, avionics and equipment, with substantial funds coming from the equip-ment and other contractors (who have already spent about £25m of their own money on the venture). venture).

These two major programmes These two major programmes—the prospective 150-seater airliner and the future-European
combat aircraft—together represent the biggest individual aircraft ventures likely to be
undertaken in Western Europe
throughout the next decade,
and as such are of great
impostance not saily to the zirframe and engine industries,
but also to a wide tauge of
sub-contractors, equipment, combonent and material manufacponent and material manufac-



Every potential contract is heavily contested with a ferocity that has surprised many in the industry worldwide.

ALTHOUGH THERE may be some slight signs of an economic upturn in the U.S., the immediate outlook for the world's major airliner manufacturers remains bleak, as the airlines continue to hold back from placing the orders for new equipment that the makers desperately need to keep their

of new jet airliners of all kinds ordered reached only 223, worth about \$5.35hn, well down on the total of 332 new jets ordered in 1981, and less than a third of the total ordered in the late 1970s, when the annual mm-ber was between 700 and 800

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Overall, the three major manufacturers — Airbus Industrie in Western Europe, and Boeing and McDonnell Douglas of the U.S. (who between them account for the bulk of all airbury are also are are departured.) liner sales) --- are desperately hoping that the signs of overall economic recovery emerging so far this year will prove to be lasting, and that better times

may be on the way.
With few big orders immediately in prospect, and most new contracts involving small numbers of alreraft requiring substantially increased efforts win, the big jet airliner builders will have to live off their accumulated backlogs through 1983 and 1984, pending any significant upturn in the airlines fortunes that will

There are some saving factors in this grim situation. One is that many of the world's existing airliner fleets are ageing, and will need to be replaced in the remaining years of this decade.

Associated in the costs of developing any one of these new versions of the world's existing Airbus product line will be high, and they are not likely to be attempted until the same of the same of the existing Airbus product line will be high, and they are not likely to be attempted until the same of the s

Another is that the imminence of new noise legislation (from 1985-86) will render many existing jets obsolete, requir-ing their replacement. Boeing of the U.S. estimates that the value of this replacement mar-

. It is not surprising that, in view of the current paucity of new Orders, every potential contract throughout the world air transport industry is heavily contested by the major manu-facturers. Airbus Industrie in Western Europe, with its 250-seat A-300 and smaller 200-plus seat A-310 short-to-medium range jets is fighting Boeing with its 767 and 757 twin-engined iet airiners with a ferocity that has surprised not only Boeing but also many others in the world aerospace industry.

production lines busy.

The extent of the recession the jet builders have projected 150-center A-320 for experienced over the last two which it believes there is a big years can be gauged from the fact that during 1982, the total of new jet airliners of all beautiful to the century, amounting perhapsions of the century amounting perhapsions. Airbus is also seeking to this century, amounting perhaps to more than 1,500 aircraft.

Plans for that aircraft are still being refined in detail, but it is possible that by the time of the Parls Air Show in July, these may have reached the point where Airbus may be able formally to announce that the venture is at last firm. At the same time, Airbus Industrie is studying plans for other new aircraft, such as the TA-11 200seat four-engined long-range (6,000 nantical miles) jet to replace the existing Booing 707s and DC-8s in world service, where longer range is required with less capacity than the current large Boeing 747 Jumbo jets or DC-10 tri-jets provide. Another new venture under study is the TA-9, a twin-engined development of the A-300, with a stretched fuselage to give seating capacity up to 410 passengers according to the configuration desired by airlines.

Beyond that, the TA-12 is a plan for a twin-engined jet for medium to long-range routes not affected by over-water regu-lations that limit twin-engined arcraft operations such as London-Colombo, Frankfurt-Bangkok, the Middle East to Japan and South America to the

world's airlines are in a stronger position to buy such refined sixcraft. In the meantime, Airbus will be concentrating its end of last year of 4.744 airdevelopment plans on derivatives of the A-300 (the Series the recession like everyone else,
600 model, for example, with its
improved fuel consumption and better than most because of the
526 jets from all sources

ket on grounds of age and noise range/payload performance) alone could be about \$58bn by and the Series 300 version of the A-310, which will be capable of flying longer distances.

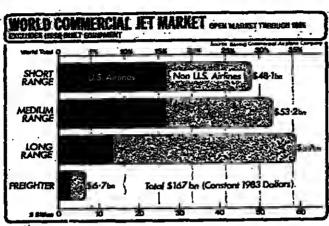
With total sales of 350 Air-With total sales of 350 Airbuses to date (248 A-300s and 102 A-310s) with many more of each type of aircraft on option, Airbus Industrie has already demonstrated that Western Europe can offer formidable competition to the U.S. in commercial airliner markets.

Despite the current paucity of

Despite the current pancity of orders, Airbus Industrie remains optimistic for the longterm. Its forecasts of the future market for jet alrimers, once the recession is ended, indicate a demand for about \$329bn, up to the end of this commy. Of this, Airbus expects to win a 34 per cent share, representing about 2,250

and consequently production, will be rising again.

This optimism is reflected in



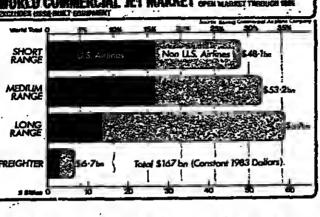
These will be primarily in the short-to-medium range market, which Airbus believes will account for some 77 per cent of total demand, or \$253bn, with the rest (\$76bn) being in the long-hanl market. This the long-haul market. This accounts for Airbus Industrie's current emphasis on the short-to-medium range A-300, A-310 and A-320, although it is not ignoring long-range possi-

Boeing the biggest jet air-liner manufacturer in the world, with total sales at the end of last year of 4.744 air-craft, has been suffering from

of close to \$15m, representing several hundred jet airliners of all types.

Although work programmes have been reduced, and the company has been cutting its labour force (with further lay-offs occurring this year), Booling nevertheless appears to be confident that it will nide the remainder of the recession. The company believes that already there are signs of a recovery in the U.S. economy, which it be-lieves will have its effect on the aerospace industry either later this year or early in 1984, and it believes that by the mid-1980s the tempo of airliner ordering.

the company's forecasts of future business. Between now and 1995, Boeing is forecasting



a total market for jet airliners of all types amounting to \$167bn (measured in 1983 constant dollar terms), of which about \$115bn will be spent by 1992, the remaining \$51bn being spent in the ensuing three This indicates Boeing's belief

that in the early to mid-1990s there will be a rising demand for jet transport, as much existing equipment will be phased out and requiring re-placement. The overall market for \$167bn of new jets is divided in Hoeing's forecasts into \$109bn for jets to meet traffic growth and \$56bn to meet replacement of older jet air-

Between 1983 and 1995,

From 1985, deliveries will continue on a rising curve, recording a high point of 450 jets in 1989, reflecting the ful-filment of the rising volume of orders which is expected in the early- to mid-1980s as the reces-

250 a time), \$59bn for long-renge jets (mostly seating 250-plus passengers a time) and about \$6.7hn for all-cargo jets.

The markets in terms of mmhers of aircraft are analysed as to 800 aircraft in the long-range category (Boeing 747s or Doug-las DC-10s), 1,150 aircraft in the large medium-range category (Boeing 767s or Airbus A300s or A310s), 1,350 aircraft in the short-to-medium-range bracket (Boeing 757s or prospective 150-seaters) and about 1,050 aircraft in the short-range category (Boeing 737s or McDonnell Douglas DC-85).

Boeing's product line rang all the way from the big 747
Jumbo jet, seating up to 400plus passengers, down to the
small 737, which is available
in various versions seating
between about 118 and 140 passengers. In between lie the passengers. In between he the
220-plus 767 and the smaller
180-plus seat 757. The longrunning, three-engined 727,
which has been the world's
best-celling jet airkiner ever,
with more than 1,830 sold to
over 100 customers worldwide, es mow being phased out. The last passenger 727 has just left the production line and the 18 remaining 727 arroraft being

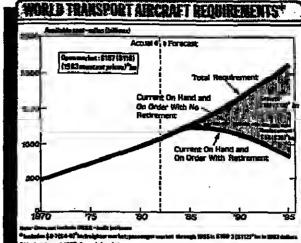
substantial state of its backlog (European and U.S.), falling in of close to \$15m, representing 1984 and 1985 (reflecting the several hundred jet airliners of slacker inflow of new orders in the 1981 and 1982 period as a result of the recession), but rising steadily thereafter.

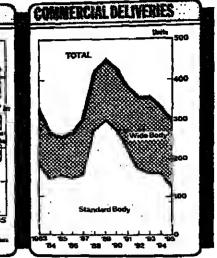
sion fades. Thereafter, that deliveries curve is expected to slacken to about the 300 jets a year level by about 1995.

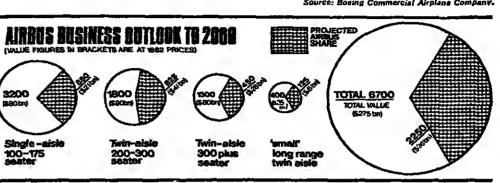
Boeing's estimates of the market suggest that, of the \$167m of total deliveries, about \$167im of solal deriveries, about \$48.1on will be accounted for by short-range jet sirlinens (mostly for sincraft seating up to about 160 passengers a time), with \$53.2on accounted for by medium-range jet sirlinens (seating between 160 and 250 a time). \$59hn for long-

built are all-cargo jets.

The new best-selling jet is the small 737, of which more than 1,060 have been sold to more than 114 customers. Over 900 of these 737s have been delivered and production is running at a rate of seven air-







remains in a class by itself. Although McDonnell Douglas with its DC-10 series has made some ingoads on the long-haul Jumbo jet market Boeing remains dominant with over 600 747s ordered in various versions, of which over 570 have now been delivered to 67 companies in 46 countries.

Much of the existing production is concentrated on the "stretched upper-deck" version, tha 747-300, in which the top deck of this abveraft is stretched by 208 inches to give extended for commercial airliners is the seating capacity, enabling up to announcement last month of an about 496 passengers to be agreement between Marconi carried on the aircraft agrinst Avionics of Rochester, Kent, about 452 in the standard England and Honeywell of version. Total orders for the Minneapolis, in the U.S. 747-300 total 32 and most of tha

more than 114 customers. Over 1900 of these 737s have been of the 747 under the broad the latest Boeing alriners, the of the 747 under the broad the latest Boeing alriners, the of and 757 twin-jet airliner remaining at a rate of seven air creat a month. Of the new stretched fuselage and a new offered by Marconi Avionics.

Boeing jets, the 767 wide-bodied twin-engined aircraft has sold 176, while the smaller version with the upper deck ing licence for the LINS equipment to be made by Marconi

Michael Donni

passengers occupants for a the UK and for appropriation of the final price of the completed aircraft avionic systems for export to countries outside the U.S. and UK.

Honovwell H421 and airliners when delivered to the customer is accounted for by equipment of one sort or another.

Agreement

A recent example of international co-operation between companies in the field of advanced electronic equipment

Under a sales and distribudeliveries this year will be of tion agreement between the two tion agreement between the two companies, the Honeywell Looking to the future, Boeing advanced lesser inertial navigation the 747 under the broad the latest Boeing airliners, the

version of the 737, the 737-300, which is due for coll-out and delivery next year, has sold 28 aircraft.

The big Boeing 747 Jumbo

to give a true "double-decker" Avionics in England. The agreement gives the British company exclusive rights to supply military LINS applications in England. The pany exclusive rights to supply military LINS applications as

H423 military systems, covered by the agreement, are being offered for the Anglo-U.S. derivatives of the Harrier vertical take-off aircraft, the AV-8B and the Royal Air Force GR-S, and as a standard inertial navigational system for the U.S Air Force.

The laser gyro from Honey well, at the heart of the LINS, plex mechanical spinning wheel gyroscopes in older inertial navigation systems obsolete.

The use of colour cathode ray tubes in becoming standard practice in airliner cockpits for the display of flight perform-ance information. The Boeing 767 and 757 twin-jet airliners and the Airbus Industrie A310 outset to use these displays in

Michael Donne



Sparrow and Sidewinder: double deterrent in Europe's air defense.

Slicing through NATO airspace, this F-15 goes through its paces as one of the world's most advanced fighters. It's suitably equipped with the world's most advanced medium- and short-range air-to-air missiles: Sparrow and Sidewinder.

Since the original Sparrow III was developed some 30 years ago, Raytheon has continued as prime contractor for succeeding models of this radarguided missile system. And we are currently in full production on the latest version of Sparrow, the AIM/RIM-7M, with greatly improved capability.

Similarly with Sidewinder. As a long-term industrial support contractor for the U.S. Navy, we produced the guidance control section and fuzing system for the currently deployed AIM-9L, and have now entered production on the next generation Sidewinder AIM-9M.

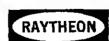
That's today. Looking further into the future, Raytheon has been selected by the U.S. Air Force as the follower producer for AMRAAM (Advanced Medium Range Air-to-Air Missile) that will play an

important role in U.S. and NATO air defense.

Bringing advanced technology to the evermore-complex world of air-to-air combat is one of our particular skills. And we bring the same expertise to ground-based air defense systems like Hawk and Patriot, and to a broad array of radar, sonar, and electronic countermeasures systems for shipboard use.

For many years, European firms have participated in cooperative production of NATO Hawk and as members of the Raytheon-managed consortium established to develop and produce the NATO Seasparrow Missile System.

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... the civil helicopter as a product in its own right still has not fully matured but is likely to do so over the next decade.

WORLD'S helicopter manufacturers are hoping that the next few years will see a significant upturn in the volume of business, with substantial growth expected in the civil sector, as more and more industries and individual customers become aware of the customers become aware of the unique benefits that rotary-winged aircraft can offer.

The capabilities of near-vertical take-off and landing, and of hovering over one place for long periods of time, have already been amply demonstrated in military roles, and in such work as search and rescue.

Evan vertical or short take-off

such work as search and rescue. Evan vertical or sbort take-off and landing fixed-wing alreraft cannot vie with this unique capability and an ever-widening range of uses for helicopters seems inevitable.

Forecasts by Sikorsky Aircraft of the U.S., a member of the United Technologies Group, and the wald's biggest single helicopter manufacturer, suggest that in the decade 1983 to 1992 the world market for helicopters of all kinds, civil and military, is likely to amount to about 24,000 aircraft, worth

about \$36bn. This compares with deliveries in the decade 1973- to 1982 of ebout 19,000 aircraft, worth around \$20bn. This market will be shared mainly between the eight major world helicopter manufecturers—Bell Helicopter Textron. Boeing Vertol, Hughes and Sikorsky, all of the U.S., and Aerospatiale of France, Agusta of Italy, Messerschmitt-Bolkow-Blohm of West Germany and Westland Helicopters of the UK. Supporting these are at umber of smaller manufacturers—including Enstrom, Hiller, Kaman and Spitfire in the U.S., and Kawasaki in Japan.

This Increase of ebout 26 per

cent overall will heve the greatest impact in the civil market, where the share of the total will rise from 53 per cent in the past decade to about 63 per cent. This will reflect a growing demand from individual companies for growing demand from individual companies for helicopters for corporate and executive use, as well as a widening range of uses for helicopters in other commercial roles.

According to Mr David S.
Lawrence, director of strategic planning for Sikorsky, these trends in turn will stem from the increasing efficiency of the helicopter as a transport to the control of the helicopter as a transport of twill also generate a wider vehicle, with greater comfort for passengers, improved styling, higher speed and increased safety—with a widening number of new designs specifically tailored to meet.

This improvement in civil helicopters is expected to be accompanied by increases in costs and selling prices of twill also generate a wider variety of uses as commercial exploitation of the helicopter expands. Sikorsky believes that the smaller types of helicopter—that is up to ebout 6,000 lb gross weight (the lightweight According to Mr David S. Lawrence, director of strategic

specifications.

In Sikorsky's view, the civil belicopter as a product in its own right still has not fully matured, but is likely to do so over the next decade. The technology is still evolving — with improved engines and rotor systems, and increasing use of new, lightweight materials, so that tomorrow's helicopters will be significantly better than tobe significantly better than to-day's and next year's signifi-cantly better than this year's.

The original impetus to com-mercial helicopter development stemming from military require-ments will fade, with the two design paths, civil and military. gradually diverging as specific civil requirements emerge, generating design solutions of their own. However, there will always be a measure of crossfertilisation between the two, and it seems likely that many new technological developments will still be funded initially through their use in military

This improvement in civil

civilian needs, instead of being adapted from original military specifications.

The Sibnesky's view, the civil interest to the commercial community.

Helicopters of 15,000 lb to 35,000 lb (the medium class) and those of upwards of 35,000 lb (the heavy class) are more likely to be needed either for military dotles, or for very specialist civil work (such as logging or lifting other heavy loads), where the market will be limited.

Siknysky believes that

Sikorsky believes that throughout the coming decade, the average annual rate of growth of helicopter manufacture and deliveries will run at ebout 5.5 per cent. The rates of growth will vary according to classes of helicopter. believes classes of helicopter.

In the lightweight class growth should averege about 5 per cent, stimulated by growth of interest in the corporate and utility marketplaces, as the past interest in this category expressed by the offshore oil and gas support industries shifts towards the larger, twinengined aircraft. In the intermediate class

growth should be higher, at sbout 7 per cent a year, with again the corporate sector show-ing most interest as industrial production generally improves after the recession and corporate profits rise. This estimate for the intermediate class also takes into considera-tion an increasing interest in inter-city helicopter ectivities, and the growth of passenger



Restyled and improved to meet the needs of the market, the Westland 30 is already in service with British Airways Helicopters in North Sea operations.

areas and airports, especially in

In the medium and heavy In the medium and heavy classes the predominant interest will be military, with only a comparatively small number of aircraft likely to be ordered for civilian purposes, so that the annual growth rate will be low.

Another significant development is likely to be that most helicopters will be turbine-powered, rather than pistonengine powered, following the development of new turbine engines of greater fuel economy and increased reliability. engines of greater fuel economy and increased reliability. Recent developments in this field have included the new version of the Rolls-Royce Gem turbo-shaft engine (for the Italian Agusta A-129 Mongoose believerter) while Gorgest

helicopter), while General Electric of the U.S. has been swarded a demonstrator engine

contract for e new 5,000 hp "modern technology" engine, the GE-27, primarily for the U.S. Army's applied technology laboratory, but with obvious long-term commercial applications.

tions.

A further trend that is likely to intensify over the next few years is that of international collaboration in new helicopter development. Last year, Sikorsky itself indicated its desire to share with new international partners the development of new technology in helicopters, and that aim stands. Sikorsky has generated substantial business over the past years through licensing its years through licensing its designs to other helicopter manufacturers, for example in the UK and Italy and elsewhere.

International collaboration in 30 passengers.
the world helicopter market is also evidenced by the West by a new joint company, EH

WORLD HELICOPTER PRODUCTION (1983-92 forecast)

e Heavy (ever 15,000 (6-15,000 2,400 12,100 24,000 Source: Sikarsky Aircreft (U.S.).

German (Messerschmitt-Bolkow-Blohm) programme with Kawasaki of Japan for the twin turbo-shaft engined BK-11? helicopter, while MBB is also working with Aerospatiale of France on plans for a new military anti-tank helicopter, the PAH-2/HAC, intended to become available in the late

But by far the largest inter-national helicopter programme now under way is the British (Westland Helicopters) and Italian (Agusta) EH-101, to pro-Italian (Agusta) EH-101, to produce e large multi-role alrerraft of over 31,000 lb gross take-off weight, powered by three U.S. General Electric T-700 throshaft engines, and designed for e variety of roles, including a replacement for the current Sea King anti-submarine helicopter. The plans envisage an eventual commercial version of the EH-101 from the start, howthe EH-101 from the start, however, so that the two versions can evolve side by side. As a civil aircraft, it is envisaged

that the EH-101 will carry up to

Industries, which has been set up by Westland and Agusta. The objective is to fly the prototype in 1984-85, with produc-tion aircraft becoming available

totype in 1884.35, with production aircraft becoming available during 1988-89.

Nevertheless, the venture is being pressed ahead by the UK and Italian Governments and is likely eventually to be the biggest single helicopter development programme in Western Europe, with ultimate production of several hundred aircraft, and involving an investment in development and production of several hundred million pounds.

In the meantime, Westland is pushing ahead with the production of its Westland 30 civil helicopter, developed from the original Lynx multi-role aircraft. Substantially re-styled and improved to meet the needs of the civil market, the 17-seat twin-turbine engined Westland 30 is already in service with British Airways Helicopters in the North Sea, while it is also on order for a variety of other operators in the UK and U.S.

Michael Donne

Michael Donne

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In every area of technology, this E³ engine is a model of innovation. For example, lightweight blade containment, full authority digital electronic control (FADEC), a low emissions combustor, and advanced cooling techniques. These and many more features in E³ are bringing the future of aircraft engines closer. In an industry where reatures in E are oringing the future of ancial engines closer. In an incusity where every minute counts, General Electric is helping to make time fly in the right direction.

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GENERAL SELECTRIC

Michael Donne outlines the steps the airlines must take to overcome their financial problems

Brake on investment

6 The airline industry argues that fare levels still lag perhaps as much as \$1bn behind the rises in fares needed to offset past rises in fuel costs alone. ?

THE MOST DIFFICULT challenge facing the airlines is likely to be finding the money with which to buy the new equipment that everyone agrees will be needed in the air transport industry through to the end

of this century. many airlines as a result of the high cost of borrowed money, has resulted in an effective, although unwritten, "buying moratorium" by the airlines on new equipment, with the result that the aerospace manufacturers themselves have been obliged to slow down production rates substantially, and even in some companies to lay off

labour in large numbers. Figures compiled by the International Air Transport Associa-tion show that the current heavy thou show that the current heavy burden of interest payments is the most serious problem con-fronting many sirlines. In 1982, for example, the collective result for the IATA member-sirlines was an operating loss of only \$250m worldwide. But by the time interest payments of \$1.61bn were taken into account, the overal loss rose to \$1.87bn.

For the current year, the operating loss will be nother

estimated at about But the burden of interest will rise to \$1.73bn, bringing the total moustry ficit to about \$2.1hn. By 1984, as a result of the various retrenchment measures introduced by many sirilines, the operating result is forecast to be a profit of about \$440m worldwide, the first for five years, but the industry will still have a deficit of \$1.40m as a result of an even higher interest burden of \$1.84hn. It is difficult for the airlines to know how to cope with this situation. There is no reason why they should be regarded as a "special case" industry, seeking relief from high interest rates. But there is every person for these to every person for these to every person. for them to argue that if the current high intenest rates continue to prevail, the re-equipment tide that many manufacturers hope will start in the mid-1980s could be blocked in mid-flow, or at best slowed

mid-flow, or at best slowed down, no matter how rapidly traffic may perover.

Answer

The financial community's awar to this is simply that are airline industry must do nuch more to put its own course in order—in short, work sarder to earn swofts.

It is now probably fair to say that, as e result of the transmatic experiences of the past two to three years, many sir-line managements have become much tougher and more efficient than they were in the fatter days of the 1970s, and that they and their airlines are therefore better geared to take advantage of the recovery when it comes.

The financiers fhemselves make no secret of their belief that the airline industry still has some way to go before it can be regarded as the prime customer for cash that it once was.

Some bankers are still fearful that before the recession ends, there may well be one or more further collapses of equal mag-

governments and aviation agencies away from any ideas they might have had of encouraging deregulation, and con-firmed them in their belief that an evolutionary, rather than revolutionary approach to change is the best possible way

Tight control

Those airlines which have been able to keep their finances under tight control and earn profits, albeit small ones, or which are supported by their governments (and the latter situation is the one most com-monly prevailing throughout the rest of the world outside the U.S.), do not find it difficult to raise cash for new aircraft. The fact is that where banks and other lenders can be reasonably assured of an airline's longterm ability to pay, finance can be arranged, as is evidenced by some recent major deals for arranged in the U.S. and else-

significant feature of The. most of these strangements, however, is that they involve consortia of lenders. While individual financial institutions are sometimes prepared to be a sole source of finance for an abliner deal where the spin involved is comparatively small. the very large deals involving many millions (even hundreds of millions) of dollars invariably implye groups of deaders, with one or more "lead managers" who put the intricate arrangements that the

ments together.

In this way, not only is the risk widely spread throughout the financial community, but also the share of the profits acruing over the deals is widely spread also. Contrary to general belief, the aerospace industry is currently one of the banks' biggest single constoners.

The banking community as a The concept of long-term leas-whole has been badly shaken ing has also been developed to by the heavy losses incurred by enable airlines to acquire new whole has been hadly shaken ing has also been developed to by the heavy losses incurred by the airlines, especially in the equipment. This is becoming U.S., in recent years, and by the demise of Laker and Braniff, effect it requires little initial not to mention a number of financial investment by the airlesser-known operators in the lesser-known operators in the the long term it can generate a steady income to the lenders through the leasing fees avail-

thie. The sirlines are often able to further collapses of equal magnitude.

THE MOST DIFFICULT challenge facing the airlines is lenge facing the airlines is likely to be finding the money with which to buy the new equipment that everyone agrees will be needed in the air transport industry through to the end of this century.

The heavy losses incurred by many airlines as a result of the obliged to become so deeply equipment plans because, in the current environment, there is

> It is a fact that across the spectrum of aircraft types, the competition generally devolves upon two types of aircraft for upon two types of sixuraft for each range/puylosid requirement—the Airbus A-300/A-310 versus the Boeing 767/757 medium-range jets, for example, or the McDonnell Douglas long-range DC-10-30 vensus the Boeing 747, or the McDonnell Douglas DC-9 Super 30 versus the Boeing 737 in the short-range class.

often no other way of selling

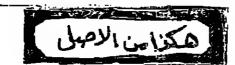
Frequently, an editine finds that it could comfortably and profitably use either one of the aircraft involved in the category in which it is interested, in which case the entire negotiation becomes a matter of which manufacturer can offer the best manufacturer can oner the pesse financial terms. The marginal differences in performance between the different aircraft on the airline's routes can often be outseigned by the financial benefits accruing over several rears from one manufacturer's years from one manufacturer's (and associated lenders') finan-

Package

Thus, many of the sales battles that are already taking place world-wide are not so much between rival types of aircraft as between the river financing packages associated with a particular manufacturer.

A classic example of this situation is that now involving British Airways, which needs a new fleet of up to 20 short-range jets by the end of 1985 to regeneral belief, the aerospace jets by the end of 1985 to reindustry is currently one of the
banks' biggest single customers,
with a current outstanding
liability of well over \$20bn a
worldwide for aircraft either on
order or recently delivered and
still being paid for.

This figure seems likely to
rise substantially in the remaining years of this decade, as the
prospective outlay by the airsind solution and solution of 1985 to reindustry is currently one of the
place ageing and by then unbackers jets. Although
a construed, long-standing
being 737 operator, with 28 of
these substantially in the remainand 300 models, and the
McDonnell Douglas DC-8 Superprospective outlay by the air-



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Business aircraft hit by cuts in world demand

6 ... the decline in demand for these aircraft ... was on a scale rarely experienced in the short history of the general aviation industry.9

THE MARKET FOR business and general aviation arcraft in the U.S., the sector's biggest market, slumped dramatically last year in the face of high interest rates and a continued tightening of companies' bud-

gets.

The industry in the U.S. acknowledges that trading conditions were difficult last year, but the manufacturers remain confident and optimistic about prospects especially in the light of moves towards lower interest

Nevertheless, the decline in demand for these aircraft, from advanced business jets to simple single-engine aircraft for pleasure use, was on a scale rarely experienced in the short history of the general aviation industry.

Resilience

The deliveries of new business and general aviation aircraft fell over the year by over half to 4,266 aircraft, compared with 9,457 delivered in 1981. The sales value of these aircraft, at a total of \$1.99bn, fell less sharply, by 31.5 per cent, from the record sales of almost \$3bn in 1981, indicating some resilience in the demand for the higher price, but lower volume business jet and turboprop aircraft.

Industry forecasts for this year indicate delivery of 4,415 aircraft, from U.S. manufac-turers, with a value of \$2bn, a slight improvement over last

This was acknowledged in a speech earlier this year by Mr Edward W. Stimpson, president of the General Aviation Manufacturers Association, "All engine aircraft, where volumes segments of the market place are greater than in the jet and segments of the market place are greater than in the jet and segment aviation industry also turbo-prop sectors but where more complex and sophisticated unit prices are lower, the U.S. business and turbo-prop sectors but where exports a substantial proportion of its output, although it by no aircraft were hit less," he told industry delivered 2,870 single-

members of the U.S. Aerospace

Analysis Society.

Figures from the association underline the importance of jet and turboprop aircraft to the sector as a whole. In 1982, the U.S. business and general aviation industry delivered a total of 259 jet aircraft out of the total deliveries of 4,266 aircraft for the year. Yet these jets, mainly for business use, represented almost half the total sales value of all the years. general aviation aircraft sold last year.

The association has forecast that there will be a further decline in volume terms for sales of these jet aircraft this year, with an estimated 175 likely to be sold, valued at

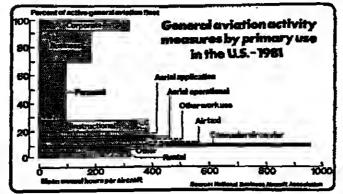
Demand for all types of business and general aviation air-craft is related closely to the performance of Gross National Product, and especially to spending on new plant and equipment, with many business aircraft purchased as a capital expenditure item.

The General Aviation Manufacturers. Association reports that sales of its categories of aircraft have paralleled new plant and equipment expenditure in the U.S. The association forecasts that increases in cor-porate spending in the U.S. later this year "should directly bene-

fit business aviation sales." Lower interest rates would also clearly help the industry, although it had been more resilient than other industries until interest rates reached 12 per cent. The first sector of the business and general aviation market to suffer was the mar-ket for single and multi-piston engine aircraft.
The impact of high interest

rates on turboprop aircraft sales was marked in 1982, with deliveries down to 458 sircraft, about half the total number delivered the previous year. The industry has forecast that up to 450 turboprops — with a market value of \$700m — are expected to be sold this year

by U.S. manufacturers. Manu- In the market for piston "All engine aircraft, where volumes



engine aircraft and 680 twinengine aircraft, a total in this category of 3,550 aircraft.

In comparison, the associa-tion has forecast a slight improvement in piston aircraft sales, with an estimated total sales, with an estimated total of 3,790 aircraft expected to be delivered this year, 3,065 single-engine aircraft and 725 twinengine aircraft, with a total walue of \$500m.

U.S. MANUFACTURERS' NET REVENUE FOR BUSINESS AND GENERAL AVIATION AIRCRAFT (Jan.-Dec. 1982)

531.8

1,99.5

Ayres Corporation Beech Aircraft Cesona Aircraft Fairchild Aircraft Gates Learjet Gulfstream American Lake Aircraft Maule Aircraft Mooney Aircraft Piper Aircraft Schweizer Aircraft

Source: General Aviation Manu- role facturers' Association (U.S.).

The industry in the U.S. is dominated by a few large com-panies and several smaller, more specialised manufacturers.

Cessna Aircraft dominated the industry last year with total sales of 2,140 business and general aviation aircraft worth \$531.8m. In value terms, Gulfstream American came second with total sales of \$446.4m from the delivery of 96 aircraft, reflecting the higher value of the company's

range of aircraft. In terms of sales volume, Piper Aircraft, specialising in producing an extensive range of smaller business and general aviation aircraft, came second with 1,048 aircraft sold last

year, worth \$179m.
The U.S. business and general aviation industry also

Last year, the U.S. manufac-turers exported 27 per cent of its aircraft production, a third of its total sales by value. Ex-ports this year are forecast to account for a quarter of sales in volume terms and 28 per cent

In Europe, British Aerospace has a limited but successful range of business and general aviation aircraft. Its highly successful HS 125 executive fet is one of the best-selling aircraft in the company's range with total sales to date of 553 aircraft. Of these, 80 per cent valued at £600m, have been sold in export markets. About 60 per cent of the exports have been to North America.

At the smaller end of the scale, BAE has its Jetstream 31 commuter aircraft, with ten firm orders for the aircraft, including one, so far unnamed, customer in the U.S. The aircraft is to be presented by British Aerospace at the Paris Air Show in a new luxury executive version with between eight and nine seats compared with the more usual 18 to 19 seats in the aircraft's communer airliner

Other manufacturers of business and general aviation aircraft in Europe include Aerospatials in France, Dornier in W. Germany, Fokker in Holland and Rinaldo Piaggio and Aeritalia in Traba

talia in Italy. In Britain, business and general aviation operations are less well developed than in the U.S., although a total of over 6,700 aircraft in the category are registered in Britain, with about two-thirds used for private and business purposes. These air-craft use the 200 or so airfields in Britain and the 2,000 airfields in Continental Europe for day-to-day operations as well at the major airports.

These simields give the oper-eter of business provent one of the sector's great advantages over conventional, scheduled flights. Few population centres in Britain or on the Continent are far from a sustable airfield, and access is rapid and easy.

Lynton McLain

Growing number of leisure flyers

LEISURE FLYING, in all its forms, is becoming a substantial growth industry for manufacturers of light zircraft, gliders, hanggliders, balloons and the new and often inconventional shapes of miscraft always? microlight aircraft.

It is estimated that as many as 50,000 people in Britain alone fly one or other of these machines for pleasure each

Flying fixed wing, powered sircraft is the most popular single category of leisure flying with an estimated 20,000 or more qualified pilots holding pulvate licences in Britain. Training for a licence to fly powered aircraft is expensive and can be time-consuming. Total costs will vary with the sid! of the student pilot, but well over £1,000 is normal.

One approved scheme involves the student training with a minimum of 35 hours flying training at an approved flying school, all to be completed within at months. A more leisurely route is the CAA (Civil Archion Authority) enthorised 40-hour flying course. This has the advantage for some students that it can be completed over any period

of time. Gliding is the second most popular Gliding is the second most popular form of leisure fiving in Britain, with an estimated 11,000 active glider pilots in the country. These pilots fly from any one of the 100 or so clubs around Britain, most of them strategically placed to take advantage of geographical features such as dong hill ridges which encourage the warm air thermals that glider pilots need for soming.

Many of Britain's top glider pilots are expected to take part in the UK National Gliding Championship, to be held at Lasham Airfield, Hants, from July 23 to 31.

The event, sponsored by Marconi Avionics, probably will be the largest gathering of gliders at one site for 15 years, with 80 top pilots contesting the Open Class National championships. Carbon fibre and glass fibre are being used increasingly in the construction

of extrement gilders, and it is the use of these light and strong materials, com-bined with advanced accommunic designs, which gives some of the top gilders lift to drag ratios—the crucial performance feature of gliders—as high

The growing number of microlight aircraft provide the third category of sircraft for leisure flying. In the U.S. the Federal Avlation Administration has

the Federal Aviation Administration has estimated that there are \$5,000 of these low-cost "ultralight" sireraft flying, with steedy growth predicted.

The Fulcon single-cost, tail-first design from the U.S. Aerolite company won the top award at a recent convention for experimental and ultralight sireraft held in Flowids. The aircraft, with its diminutive 28 hp engine and speed of up to 60 miles an hour, typifies the type of the first on the market for less than the of craft on the market for less than the puice of a family saloon ear—in shis case, \$6,000 in kit form.

Signs of cargo demand reviving

6 Airlines and airport authorities are cautiously optimistic that the decline in demand for air cargo services has ended.9

THE SUSTAINED stomp in demand for air cargo services throughout the world over the past two years is showing tenta-tive signs of easing as condi-tions for world trade in general improve in the light of lower

At the same time, the vigorous cutting of freight rates preva-lent from the start of lest year has been replaced by a more stable regime of rates which are more comfortably above the cost of operating air cargo

services. Last year, some of these rates, especially over the once hura-tive North Atlantic air routes. fell substantially below the minimum level necessary to provide the services.

Airlines operating on the North Atlantic routes estimate that it costs 21p to fly a kilo-gramme of freight from, say London to New York. At the height of the rate-cutting war last year rates fell as low as 12p z kilogramme—"hopelessly nomic " according to some

The industrial and commercial customers of the air cargo services, in general, have not rebelled against these rates, giving substance to thoughts that the worst of the recession so far as air cargo is concerned may well have passed.

Airlines and airport authori-Arrines and airport authorities are cautiously optimistic that the decline in demand for air cargo services has ended. The cargo sector did not grow at all between 1979 and 1980, when lim tonnes of freight were carried by world airlines according to the International Civil Aviation Organisation.

Between 1980 and 1981 the

Between 1980 and 1981, the Between 1980 and 1981, the volume of air cargo declined substantialy, by 2 per cent to 10.8m sommes, although the activity in the air cargo sector, measured more compresively by tonne-kilometres, flecting the tonnage and the distance carried, increased by 5 per cent to 30,160 tonne-kilo-

This increase at a time of de-clining tonnage volume, indi-cates that the long-distance air cargo sector perhaps stood up more resiliently to the pressures of the recession than the short-haul husiness.

By the end of last year, a facility agreement among the sirming resulted in air freight air cargo ecctor worldwide, with per cent to 167,000 tonnes, and the ICAO reporting a growth of air cargo traffic on UK domestic levels of between 30 and 40p a kilogramme.

The industrial and commercial continues are cargo traffic on UK domestic tonnes, according to preliminary tonnes, despite the mixed continues of the UK air cargo industry last year, there

In Britain, the airlines operat-ing air cargo services suffered more than airline worldwide, with the seven airports of the British Airports Authority reporting a total of 599,000 tonner of air cargo lifted in exports and imports last year, a decline of 4.7 per cent on the previous

Suffered Some of the BAA's eirports suffered particularly hadly, with Prestwick in Scotland, showing a 34 per cent decline to 11,700 tounes. Glasgow showed a 4

> In the south east of England, the country's major airports, at Heathrow and Gatwick, and the smaller Stansted, reported that a total of 566,000 tonnes of siz cargo was handled last year, a decline of 4 per cent on 1981.

per cent increase, at 12,400

Of the world markets served by air cargo carriers operating out of airports run by the British Airports Authority, those to Africa showed the greatest de-cline last year, with a fall of just over 15 per cent to 67,800

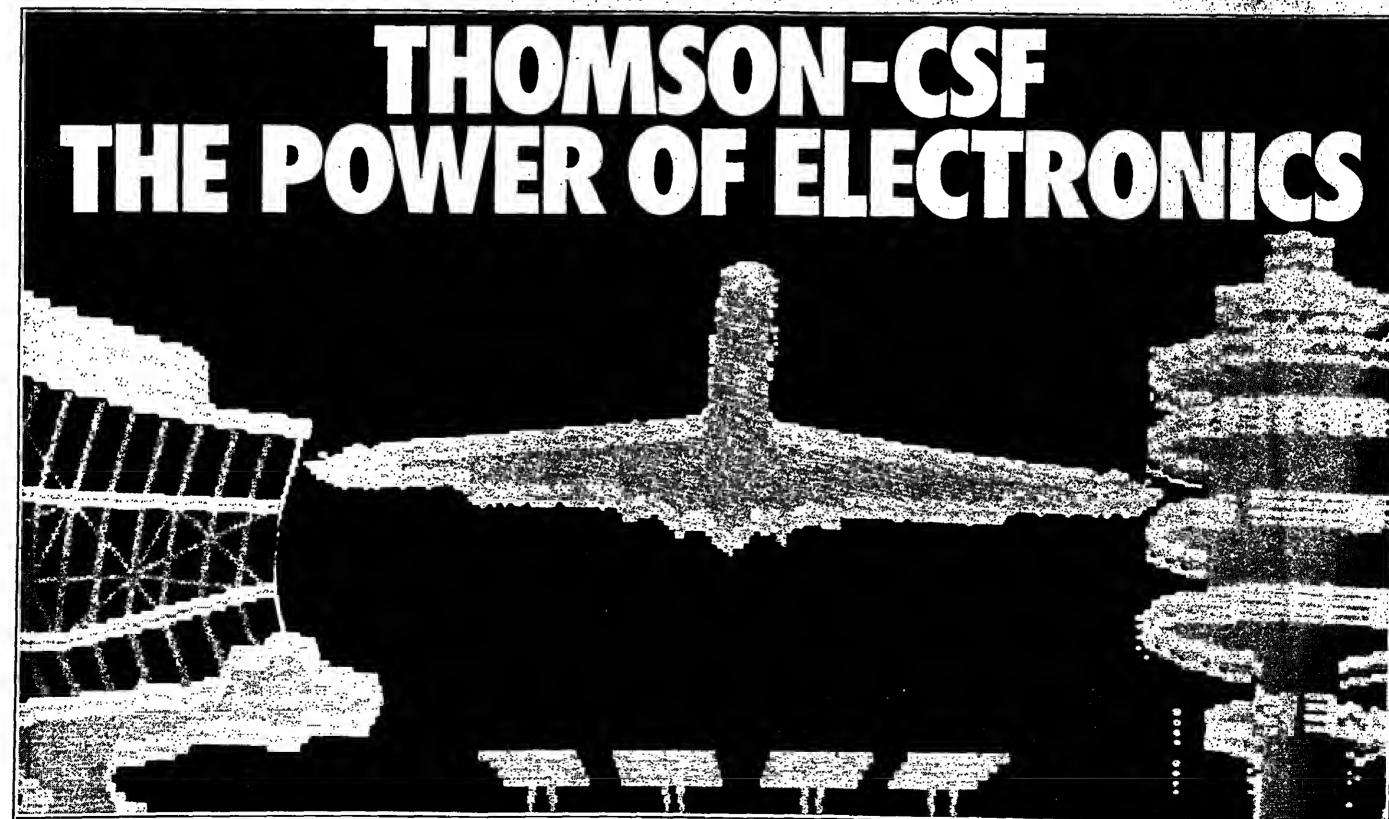
cargo industry last year, there are signs that the higher rates on the North Atlantic are likely to remain in force this year. British Airways quotes a rate of 46 pence a kilogramme for 500 kilogramme cargo loads on the London to New York route, higher than the rates charged last autumn and winter and indicative of the stronger

and indicative of the stronger demand for air freight services. The airlines in general have cut back their air cargo capa-city, with the specialised all-cargo aircraft operated by fewer of the scheduled carriers therein the past. These airlines have made stremous efforts to consolidate more of their air cargoes into the holds of their

remaining passenger aircraft, in an attempt to maximise the use made of resources.

This development has not prevented specialised all-cargo air-lines from operating regular actions with their resolutions. acryices with their specialised fleets. Flying Thers, the U.S. airline, remains the world's largest all-cargo carrier and is the world's largest operator of Bueing 747 and DCS aircraft.

Lynton McLain



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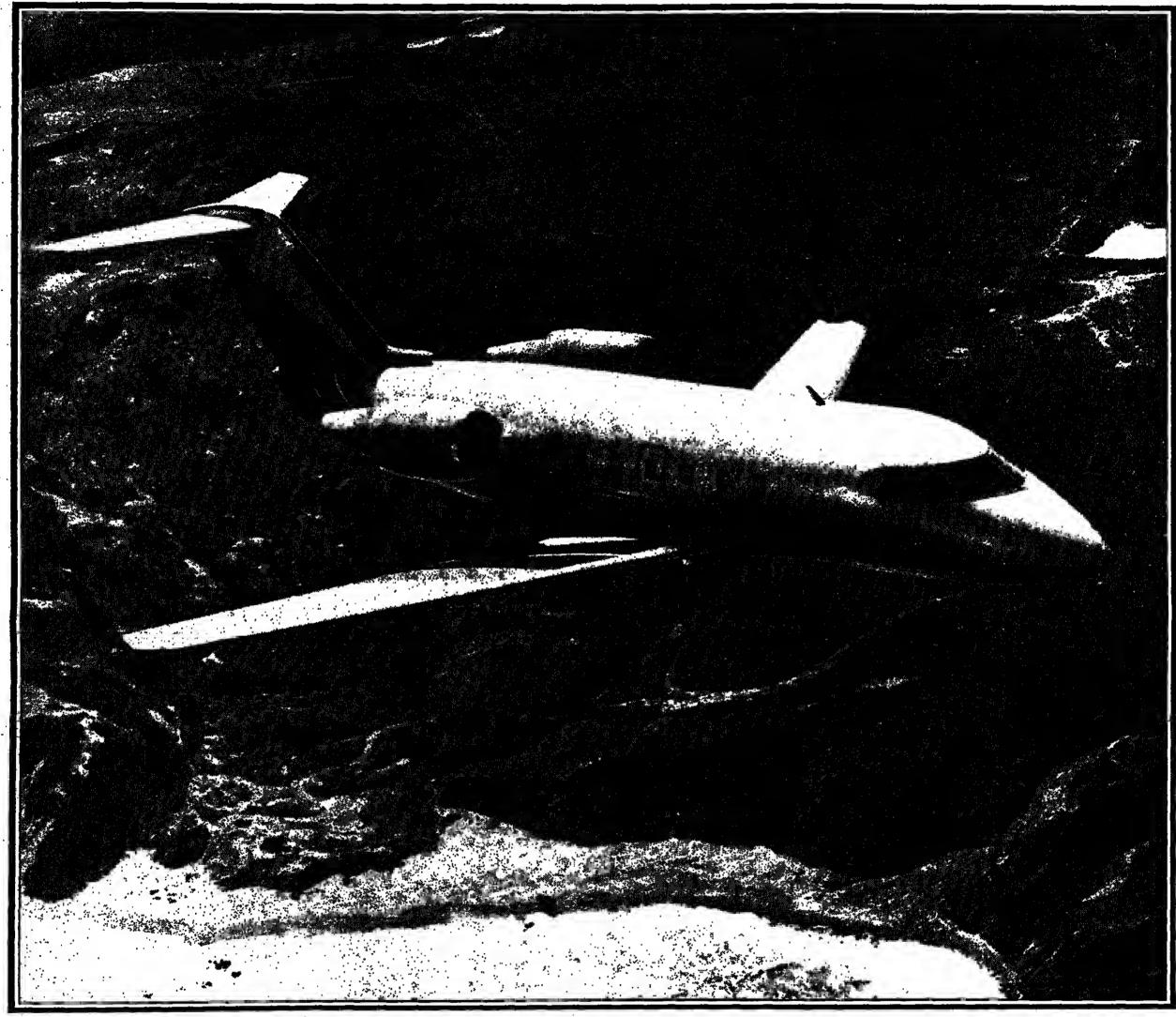
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More ventures needed to fill factories

The UK

THE UK aerospace industry has been for some time a major exporter, generating a surplus on balance of payments account despite the beavy imports of foreign-built aircraft, especially commercial airliners.

During 1982, the UK industry as a whole exported over £3.11bn of its products, or more than 20 per cent greater than in 1981. Of this total, exports of sircraft and parts accounted for over £1.6hn while exports of engines and parts accounted for over £1.17bn.

All sections of this industry did well, however, with guided weapons exports amounting to more than £61m, instruments for over £152m and radio communications aids for close to

Against this, however, there were imports amounting to over £1.98bn, so that the overall sur-plus on the balance of payments account was £1.12hn.

New ventures

A significant feature of the export statistics, however, is the high volume of parts and spares involved—over £1.15bn for aircraft parts and over £492m for engine parts. This reflects the influence of international collaborative programmes in which UK companies manufacture parts for joint ventures (wings for the European Airbus, for example), while it also reflects the way in which aircraft and engine ventures begun some time earlier can continue to yield high incomes for many

years.
But the export statistics also indicate that the industry needs new ventures, both military and civil, with which to fill its factories through the rest of this decade and through the 1990s. The number of "new aircraft" exported last year amounted to only £346m, or little more than 10 per cent of little more than 10 per cent of total exports, while "new engines" accounted for a rather higher proportion, at nearly £486m. It is hoped that as current new ventures—such as the British Aerospace 146 four-engined jet regional airliner build up sales, this situation

British Aerospace remains the linch-pin around which the of the year the order backlog UK aerospace industry is concentrated, developing a wide pared with £3.89bn at the end range of civil aircraft, from the of 1981. BAe 146 four-engined regional The group chairman, Sir airliner, through to the Jet Austin Pearce, in his review of stream 31 and BAe 748 twin- 1982, made it clear that while engined turbo-prop airliners space, missiles and military air-

and the small BAe 125 twin-jet executive aircraft.

In addition, BAe has a 20 per cent stake in the European Airbus Industrie airliner manufac-A-300 and A-310 twin-engined jet airliners BAe builds the wings, with plans also now being finalised for a probable participation by the UK group in wing production for the projected new A-320 150-seater version of the Airbus.

At the same time, BAe's involvement in military aviation remains strong, with production of the Anglo-West German-Italian Tornado multi-role combat aircraft (of which eventu-ally 809 are to be built) now running at a high level, alongaide continued production of Jaguer jet strike-trainers for international markets. Work on the UK share

work on the UK share of the production of the AV-8B Harrier II, for both the U.S. Marine Corps and the RAF, is also now a major aspect of BAe's military activity, at its Kingston-Brough Division, as is production of the Hawk jet trainer and light tactical combat aircraft for both the RAF and overseas markets. A version of overseas markets. A version of the Hawk has been selected by the U.S. Navy for its under-graduate jet flight training pro-gramme, the VTXTS.

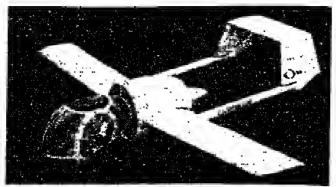
In Space, too, BAe is develop-ing an expanding business, through its Dynamics Group, especially in the development and production of satellites for communications and other duties, for the European Space

Agency and other customers.

One of the most significant aspects of BAe's space work is the building of the Unisat communications satellite capable of about £120m, which will be Britain's first communications. munications satellite, worth direct broadcasting transmis-sions from space into private

homes.
The increasing volume of BAe's military missile business is discussed elsewhere in this

survey. The effect of all these activities during 1982 was to generato a 24 per cent increase in world-wide sales by BAe, with a profit before tax of £84.7m, 20 per cent up on 1981. Sales reached over £2bn, compared with over £1.66bn in 1981, and at the end



The Edgley Optica, made by Edgley Aircraft, is now steadily winning acceptance at home and overseas

craft activities all did well, the as a result of the recession and competition worldwide was development of a future Euro-fierce. In view of the likely continuation of low demand for airliner, but is also planning continuation of low demand for arrither, but is also planning new airliners, as a result of the development of a new, the airlines' lack of enthusiasm advanced twin-engined turbofor new jets, BAe has made a prop powered airliner of its special provision of £100m in own, the Advanced Turbo-Prop special provision of £100m in its 1982 accounts, to cover the continued cost of development and production of the 146 and other civil aircraft pending a revival of sales in an improved economic situation, and the need to cover BAe'a own contri-butions to financing airline orders for Airbuses and other

To signify its confidence in weakest sector was civil air- the long-term future of civil craft, where demand was low aviation, BAe is not only preparing to participate in the (ATP), aeating up to 64 pas-sengers, which will complement the existing BAe 748 in world markets.

After British Aerospace, Short Brothers of Belfast is the largest fixed-wing aircraft manu-facturer in the UK, with emphasis upon commuter airliners such as the twin-engined

Balloon record bid

AN ATTEMPT to set a new world altitude record for hot air balloons is to be made in the UK this summer by Mr Mike Kendrick, managing director of Lighter Than Air, a hot air balloon and airship operator, and Mr Per Lindstrand, who heads his own balloon and airship manufacturing company, Colt

The hot air balloon altitude record is 55,134 feet, but the two men sim to go mach higher. The balloon and pilots' capsulo havo been specially designed by Mr Lindstrand, and in theory an altitude of about 100,000 feet is achievable. The venture, called Operation Sky Quest. is sponsored by the National Dairy Council and many other British companies,

The balloon itself will be

bullet-shaped, about 200 feet high and made of over 6,000 yards of Kevlar fabric. It will contain more than 400,000 cubic feet of air. To achieve the necessary lift, the air must be as het as possible, within the limitations of the envelope fabric. To reach those high temperatures, the burner system will be the

most powerful yet, including a secret new design development to enable it to burn at heights where the rarified air would not normally support The crew's pressurised capsule will contain an on-

board computer to co-ordinato information on weather conditions and to help in navigation and in communications with the ground. The launch probably will be in July.

30-seat SD-330 and the larger including the new turbine-36-seat SD-360. Islander, and the Defender for

Both of these aircraft are military roles. Total deliveries wide-bodied, and have sold well by Pilatus Britten-Norman now overseas as well as in the UK, with a substantial backlog on especially in the U.S., where they have been much in demand from the commuter airsenant from the commuter airlines. To date, more than 112
SD-330s have been sold, of
which over 90 have been
delivered, while orders and
options for the 360 stand at
over 46 aircraft, of which over
ten have been delivered ten have been delivered.

The smaller Skyvan, a short take-off and landing aircraft, which has been in production for several years, with over 150 sold, continues to sell well overseas, where it is employed in a wide range of civil and

military roles.
Short Brothers, however, is more than just an aircraft of 600 mautical miles. builder. It has built up a substantial reputation in the "aerostructures" business—the supply of parts for other manufacturers' aircraft.

One element of this is engine nacelles for large-thrust engines, in which Shorts claims to be the leading specialist in Western Europe. The company builds nacelle components for Rolls-Royce RB-211 engines installed on Registr 242 June installed on Boeing 747 Jumbo jets and Boeing 757s, while it also builds complete engine nacelles for the U.S. Avco-Lycoming engines jet used on the new BAe 146 airliner. Other major aspects of the

Short Brothers aerostructures business in lude the risk-sharing partnership with Fokker of Holland covering wing design and production for the F-28 Fellowship alriner, and the manufacture of wing components for the Boeing 757. and landing gear doors for the

Boeing 747. Shorts is also substantially involved in the guided weapons industry, especially with its Blowpipe portable close-range guided missile, Seacat close-range ship-borno auti-aircraft missile and its Tigercat land-based variant

In addition to its main airreaft, aerostructures and missilo businesses, Shorts is involved in a number of alkied projects, prominent among which are its flying services activities, which include the provision of maintenance and operational services are situated in the state of Wight, is building the Firecraft, with a turbo-prop version under way also, and an agricultural aircraft called the NDN-6 Fieldmaster.

Slingsby Aviation, of Kirkby-

active in the Isle of Wight, building the twin-engined Islander light transport, with various versions on offer—

Islander, and the Defender for with a substantial backleg on

Also of significance for the UK industry's long-term future are the effonts of several manufacturers who are seeking to promote the expansion of small, light aircraft manufacture. One is Edgley Aircraft, which is building the small, three-seat observation aircraft, called the

hand.

This aircraft, which in design looks like a bulbous-eyed insect, can loiter at 57 mph, with a stalling speed as low as 46 mph. It is idea for any form of serial work requiring slow, stable flying, and it has a range

Start up delayed

An initial production run of 200 aircraft is planned, with firm orders in hand for 26 aircraft, and many more in negotia-tion at home and overseas. tion at home and overseas.

Another new company is Fan Holdings, a U.S.-based company in Reno, in which the UK Government has a 5 per cent shareholding. The UK Government has pumped substantial cash into the company (over £7m in grants, over £18m in loans and funther substantial bank guarantees), to help the production in Northern Ireland of a turbo-prop afteraft called the Lear Fan, an executive machine making extensive use of carbon fibre in its construction.

Production start-up has been

Production start-up has been delayed, pending certification of the aircraft in the U.S. by the Federal Aviation Administration, but it is still hoped to get the project under way by late summer.

There are in addition several

There are in addition several smaller companies active in the fixed-wing flight aircraft manufacturing field. Afteraft Designs (Bembridge), of the Isle of Wight, is working on the Sheriff two to four lightweight training and utility aircraft, while MDN Aircraft, also of the Isle of Wight is building the Fire.

provision of maintenance and operational services for military and civil organisations.

Slingsby Aviation, of Kirkby-moonside, Yorkshire, is building under licence the French In the smaller aircraft cate- Fournier two-seat light aircraft, gory, Pilatus Britten-Norman is designated the T-67, which is active in the Isle of Wight, intended to be available in several versions.

Michael Donne



Skyship 500, taking off at R.A.E. Cardington, near Bedford

Airships boost in the UK

A BIG EFFORT to reawaken both public and commercial interest in the long-term potential of the airship is

potential of the airship is being made in the UK by the private-venture company, Airship Industries.

This company is involved in the design, manufacture and flight operation of a new generation of non-rigid airships which incorporate modern, lightweight, high-strength materials and many new design features. new design features.
The craft now being developed by Airship Indus-

developed by Airship Industries uses non-combustible helium gas as the lifting agent — eliminating the dangers associated with the earlier airships which used the highly flammable hydrogen—and has "vectoring propellors" to provide vertical take off and landing.

The first craft hult by the company is the Skyship 500. company is the Skyship 500, which first flew in September 1981, and which has been per-forming successfully since in

the UK and on the Continent, including last year's Farnincluding last year's Farn-borough Air Show.

A second Skyship 500 has been assembled in Canada where it fiew a few weeks agu.
It is to undertake trials this summer for the U.S. Navy— which has been an extensive user of non-rigid airships ("blimps") for escort and patrol work.

patrol work.

The Skyship 500 seats up to 12 passengers, and has a maximum speed of about 60 knots, with a disposable lead of about 2 tens. A larger craft, the Skyship 600, seating up to 20 passengers, is now under development.

For the longer-term, the company is planning even larger craft, such as the Skyship for the longer-term, the company is planning even larger craft, such as the Skyship for the Skyship f

larger craft, such as the Skyship 2000 seating up to 80 passengers and the Skyship 5000 seating nearly 200, How-

ever, these two latter ventures are still a long way ahead.

Al claims that there are many advantages for the modern airship compared with its fixed-wing and rotary-winged counterparts. The primary benefits are that it is cheaper to operate, and does not require the yast expanses of modern airports in which to load and unload. Moreover, it is yery quiet, causing none of the noise and pellution problems so often associated with other types of aircraft.

aircraft. Another advantage is that Anomer advantage is that it is comparatively slow-flying, so that it is potentially useful for a wide range of tasks that fixed-wing aircraft cannot perform because of their implificing to fly slowly, or which rotarywinged aircraft cannot
perform because of their
comparatively high costs.
The airship, for example,
is exceptionally valuable as
a surveillance vehicle for
military and civilian duties
(the latter include police
traffic surveillance, tourist
sightseeing, TV and radio
platform, advertising, inspection of pipelines and other
installations, fire-watching in
forests and other areas, and
search and rescue activities).
Alrship Industries believes
strongly, therefore, that there
is a place for the airship in
the current world aerospace to fly slowly, or which rotary-

the current world aerospace scene. Its main task is to demonstrate this by not only continuing to fly the Skyship 500, and also the larger Skyship 600 later this summer, but also by whaning orders from interested customers. and building up a strong back-ground of safe, reliable and profitable operational experi-

M. D.



Military orders acting as a prop

The U.S.

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THE U.S. AEROSPACE industry is not exactly booming.
But perhaps remarkably given
the state of the airline industry,
the profit figures coming out
of the serospace sector are not
that bad either.

Last year the U.S. industry recorded sales of about \$63.3bn, down 6.7 per cent and the first decline in a decade. But the industry has adapted to the new

Military orders undoubtedly have propped up the industry, staving off disaster for some companies and enabling others to post reasonably bealthy fullyear and first-quarter earnings figures, but other changes have been under way.

been under way.

Costs, and in some cases workforces, have been cut, capital
spending has been delayed or
cancelled, debt ratios have been
brought down, businesses have
been diversified and, perhaps,
most crucially — new financing
matheds to sall sireraft have methods to sell aircraft have

Lockheed bit the bullet in lete 1981 and decided to balt pro-duction of the L1011, taking a \$28.70 a share write-off in the process. For McDonnell and Boeing, riding out the recession has proved only slightly

more palatable.
The manufacturers serving the commercial airline market have had some of the tonghest

Braniff and Laker are symptomatic of the crisis which the airlines have been facing. With airlines such as Delta, Pan American, TWA, United and Eastern all reporting huge full year and first quarter losses, they have not been exactly bending over backwards to buy new aircraft.

bending over backwards to buy new aircraft.

Both Boeing and McDonnell

Douglas remain committed to the commercial market, but they have paid the price in falling sales and operating losses on their commercial air-

losses on their commercial aircraft husiness.

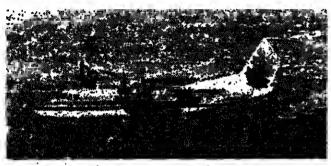
Last year Boeing announced new orders for 110 jet transports worth \$3bn compared with orders the year before for 224 jets worth \$6.1bn. And McDonnell Douglas, in spits of boasting tha higgest seller of the year, the Super 80 with 48 per cent of a very depressed worldwide market, fared little better.

First-quarter sales at McDonnell were higher in all divisions except commercial aircraft, whera sales fell by 15 per cent.

To cope with falling demand both McDonnell Douglas and Boeing have been forced to adopt a more flexible attituda to selling their jettiners.

Both McDonnell Douglas and Boeing have entered into dealers.

Boeing have entered into deals recently involving them in buying back old aircraft from cus have had some of the tonghest tomers in order to win new decisions to make over the last orders. Boeing, under an eight-18 months. The well-publicised year leasing deal covaring tha airline failures like those of sale of 33 737-200s to Delta, is



The Canadian aerospace industry is small but highly active and has specialised particularly in the development of light transport aircraft capable of short take-off and landing (STOL). De Havilland of Canada has been successful in the commuter aircraft field with its Dash Seven 50-seat four-engine transport (above) and is also building the smaller twin-engined 36-seat Dash Eight.

Exports aiding resilience

France

FRENCH industry has been feeling the pinch from the world recession, domestic defence cutbacks, and the financial difficulties of some client countries. But compared with the general malaise of the bulk of companies in the public sector, the mainly nationalised or state-controlled acrospace groups, while not exactly bloom-ing, have shown evidence of healthy resilience in the last two difficult years.

The main boister against mis-

fortime has come from exports
especially from military
orders, which make up about
two-thirds of ell foreign sales.
With the civil aviation market depressed by the economic slump and the financial difficulslump and the financial difficul-ties of world sirlines, Airbus sales have been hit hard— although as the French-led con-sortium (and the Paris govern-mo(1) never thre of pointing out, it has done better than its main competitors Boeing and McDooned Douglas.

McDonnet Douglas.

More than ever, then, military favourities have been making the running. Technical data on the Mirage 2000 and Super Etendard jets and the Exacet missile (which both became mail) became during the Falk. missile (which both became well known during the Falk-lands war) are now essential items in the glossary of com-mercial phrases which French Ministers take with them on trips to countries in the Middle East or Asia.

East or Asia.

Both the two main state-run aerospace companies, Aerospatiale (with a turnover of about FFr 21on (\$2.90n) and a workforce of 35,000) and Dassanit-Breguet (turnover FFr 13on, workforce of 16,000) have recently taken measures to adapt production to falking demand. The aerospace sector as a whole, with c workforce of as a whole, with c worldorce of 116,000, has been an important creator of lobs in recent years, but now faces leaner times.

Pariner

Aerospatiale, which as well as being the main pariner in the Airbus consortium also makes belicopters, missiles (not only Exocet, but also balistic missiles for the "force de trappe") and rockets (including the European space launcher Ariane), has been hit particularly by a dramatic cut in helicopter orders on the U.S. market. The company's profit last years is believed to have been well down from the EFF 400m in 1981.

Dassault makes Miraze jet fighters as well as the Falcon executive jets. Although report orders for the Mirage 2000 and

better. Commercial aircraft sales fell

by almost a half from the pre-vious year and the company recorded a \$45.8m loss on its commercial aircraft division. First-quarter sales at McDonnell

F.I have stood up well—among others, from India, Peru, Egypt and Iraq — the company has been affected by a cancellation of French Air Force orders and the downturn in civil sales, Matra, the diversified arms and electronics group, owned 51 per cent by the state, is still chaking up profits from its missiles sector. But the Aerospatiale, Matra has achieved sales of satellities below expectations, mainly because of heavy competition

from the U.S. on world markets To face up to the problem of "Franco-French" competition between the two companies to win foreign customers, the Paris Government is proposing that Aerospatiale and Matre pool their sales efforts for satellites and enter into other kinds of industrial collaboration—a step which companies up to now

resisting.
Turnover of the whole French Turnover of the whole French aerospace sector last year rose 19 per cent (well ahead of the roughly 10 per cent inflation rate) to FFr 52hn, according to preliminary estimates from the industry grouping GIFAS. Showing the overwhelming importance of export sales, foreign orders climbed 26 per cent to FFr 44bn, with foreign deliveries rising 22 per cent to FFr 23bn.

The industry has a net foreign trade surplus of about FFr 23bn, putting it in the forefront of the country's currency earners.

The problems facing the Airbus consortium were under-lined in January when Gen Jacques Mitterrand, chairman of Aerospatiale, warned in a memorandum leaked to the memorandum leaked to the Press that the Airbus programme was "preoccupying." The Airbus Industric chairman, M Bernard Lathiere, promptly hit back by saying that Gen Mitterrand's remarks represented a present worth millions to Boeing, and pointed out that with orders of shout 130 airwith orders of about 130 air-craft in hand, the consortium still had enough work for 21

earlier this year wrapped up per cent military.
the biggest commercial aircraft
deal ever with Alitalia, is buytractor for the

to buy 30 Super 80 jets for McDonnell has also spear-headed the most inhovative financing packages in the mar-ket. In two separate deals at the end of last year the company

the end of last year the company offered TWA and American Airlines short-term operating leases on a total of 35 new Super 80s at very fevourable terms. Those two orders helped push McDonnell's order book up to \$10bn at the end of the year. McDonnell Donglas recognises the risks involved in such leasing packages and has said it will require \$700m in financing, but believes the packages were necessary to preserve production.

follow much of the rest of the industry into the arms of tha Pentagon. Last year about 55 Military sales have been a with its two new airliners, tha per cent of McDonnell's sales major factor in the industry's 757 and 767 hnt, lika came from military aircraft survival, for exampla McDonnell Douglas, has blown

The company, the main con-tractor for the controversial ing back used jets from the F18, would like to see a more Italian airline which has egreed halanced order book but halanced order book but believes it unlikely that it will ever again achieve the 50-50 split reached in 1978-1979.

At Boeing, which manufectures Minutemen missiles and does work on the MX, U.S. government sales represented 35 per cent of the total last year. At Northrop, a 40 per cent partner in the F18 and manufacturer of the F5 as well as a fired sea sub-contractor. government sales represented 25 per cent of the total last year. At Northrop, a 40 per cent partner in the F18 and manufacturer of the F5 as well as a fuselage sub-contractor for the Boeing 747, the figure was 78 per cent. Grumman's sales come 79 per cent from the U.S. government.

General Dynamics

General Dynamics, the largest U.S. defence contractor, which huids F-111 parts, the F-16 and the Tomahawk Cruise missile, received 88 per cent of Alternative its \$8.15 bn sales last year from the U.S. government. As with able one at present for the other main aerospace commodonnell Dougias, is to panies, the percentage of earnfollow much of the rest of the ings derived from government business is even higher.

huying back 11 L-10-11s and and another 18 per cent from McDonnell has been able to spacecraft and missiles, and its keep the Long Beach DC-10 McDonnell Douglas, which current order book is about 90 production line running only because of a \$2.75n Pentagon order for 44 KC-10s, the military version of the commercial jet.

But that is not to say military business is without its risks. For example, both McDonnell Douglas and Northrop are acutely aware that the F18 programme, with 1,368 jets ordered, is still under attack in Congre

The heavier reliance of tha U.S. aerospace industry on military spending has coincided with a more conservative approach to the massive risks in developing new commercial fets — an expensive game of crystal hall gazing which often appears to depend on reading

the market 20 years ahead.

Roeing has pushed ahead



Lockheed TR-1 high-altitude single-seat reconnaissance and surveillance aircraft designed to provide all-weather information in both peace and war

PERFO	RMAN	CE OF	u.s.	AERO	SPACE	COMPA	MIES	
	Sales 12 mths 1982 (\$m)	% change from 1981			Sales Ist qtr. 1983 (\$m)	change from 1982	Earnings 1st qtr. 1983 (5m)	from
Boeing General Dynamics Grunman Lockheed Martin Marietta McDonnell Douglas Northrop United Technologies	2,656.7 5,613.0 2,526.5 7,331.3 2,472.9	- 8 +29 +15 + g + 7 - 1 +24 - 1	292.0 160.5 90.3 207.3 91.6 214.7 5.4 426.9	-38 + 9 +22 +34 -54 +22 -89 -7	2,989.0 1,827.1 509.1 1,415.8 801.9 2,074.9 730.2 3,535,4	+43 +47 +8 +24 +21 +21	90.0 56.8 22.0 51.8 13.8 59.9 7.3	+ 48 +101 +199 + 38 - 13 + 24 n.e. + 15

cool on prospects for the new 1990s and is also prepared to ordered, can steve off airlines like Delta have urged. which Alaska airlines has just ordered, can steve off airline derivetive. McDonnell Douglas, like Delta have urged.

Boeing is committed to spending \$10m a year on development of sucb a jet for the derivatives like the DC3

derivetive. McDonnell Douglas, demand for a new jet the economics are right."

Super 80 and other DC9

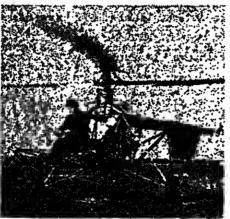
derivatives like the DC3

Paul Ta

Paul Taylor

The First.

Igor Sikorsky flew the world's first practical helicopter on September 14, 1939. Today, Sikorsky, the company, is the largest helicopter manufacturer



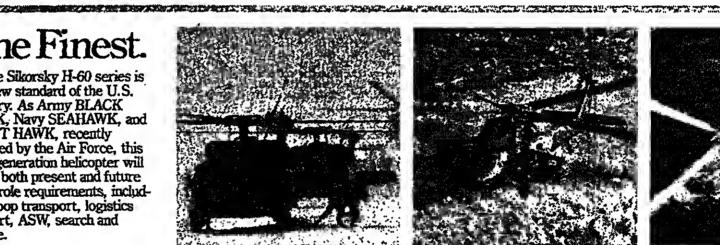
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The Sikorsky H-60 series is the new standard of the U.S. Military. As Army BLACK HAWK, Navy SEAHAWK, and NIGHT HAWK, recently selected by the Air Force, this next-generation helicopter will serve both present and future multi-role requirements, including troop transport, logistics support, ASW, search and

Sikorsky's SUPERSTALLION H-53E is the Western World's largest heavy-lift helicopter, now being used by the U.S. Marines and Navy for any task requiring up to a 16-ton lift. The MH-53E will be used by the Navy as the next-generation airborne minesweeper.

The technology that produced these aircraft created the finest commercial helicopter in its class, the Sikorsky S-76 MARK II. The high level of maturity and acceptance achieved by this aircraft early in its evolution are the result of over 200,000 flight hours. In the tough offshore oil market, MARK II is delivering 95% availability, over 98% reliability. In the highly competitive corporate marketplace, MARK II is the most popular twin turbine helicopter.

And in the AUH-76 military helicopter, Sikorsky has blended commercial and military expertise to create a multi-role aircraft destined for worldwide service.















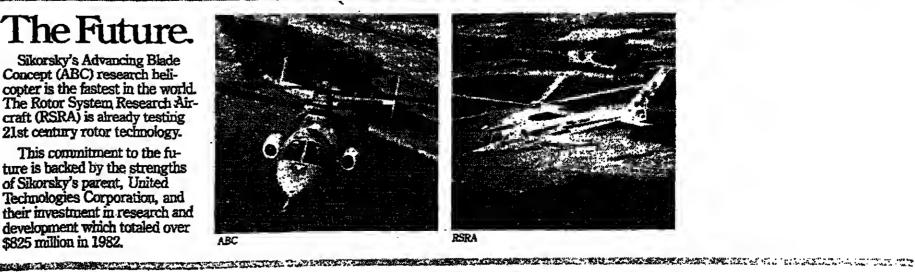




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Sikorsky's Advancing Blade Concept (ABC) research helicopter is the fastest in the world. The Rotor System Research Aircraft (RSRA) is already testing 21st century rotor technology.

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The A-310—built by Airbus Industrie, in which West Germany is a partner—is a shortened version of the A-300 wide-body airliner with a new wing which provides big fuel savings, as a result of lower weight and drag

Jobs squeezed by drop in orders

W. Germany

THE WEST GERMAN aero-space industry is in a most uncomfortable position, wedged between a stubborn recession in civil air transport and frozen government spending on mili-

Problems came to a head last autumn at Messerschmitt-Boelkow-Blohm (MBB), which accounts for two-thirds of the industry in its narrow sense.
MBB, which is the end product of a series of mergers that has absorbed all but Dornier and MTU, the engine manufacturer, of the main companies, announced changes which would reduce the workforce to 34,500 in the course of this year from 40,000 at the start of 1982 and including 2,500 redundancies.

The shock of this announcement was compounded in January when Prof. Gero Madelun, a gifted aircraft engineer in the German post-war tradi-tion (and nephew of Willy Messerschmidt) was replaced as chief executive by Dr Hanns Arnt Vogels, a former partner in the Flick industrial group

As well as being MBB's fourth chief executive in six years, Dr Vogels is also the first not to have a technical background in aviation, although Flick is in the armaments business through its subsidiaries Krauss Maffie and Dynamit Nobel

The problems highlighted by the lay-offs and management changes lies at the very basis of the new MBB, which com-pleted the takeover of Verein-igte Flugtechnische Werke in Bremen in 1981 and now turns over DM 5.6bn.

Despite the scattering of the new concern between VFW's works on the north coast and MBB's base in Bavaria, and the absorbtion problems MBB has

FLYING

Chartered Surveyors

never sought to play down, the merger offered the possibility of mutual support between the civil side of VFW and the predominantly defence-oriented

However, with sales of the Airbus A-300 and A-310 in the doldrums and marked lack of enthusiasm for a new A-320 (not least from Lufthansa, that does not seem to want a 150seat airliner), MBB has also found that the election of a conservative government in Bonn has done little to lift the military procurement budget.

Defence spending for 1983 will see only a marginal in-crease over last year in terms adjusted for inflation and Dr Manfred Woerner, the Christian Democrat Defence Minister, has said he will wait for the in-creases the Bundeswehr badly needs until overall state finances are in order and net borrowing (DM 40bn (\$16.6bn) for 1983)

Harder

Back at MBB, the federal states that are the main shareholders have had to accept that the workforce in the constituencies will shrink to at least 35,000 by the end of the year. However, they demanded in January that a harder and more political chief executive should replace the gentle Prof. Made-

Dr Vogels, the candidate of the Bavarian public sector re-presentatives, was adopted as a presentatives, was adopted as a man with a reputation for good contacts in Bonn while Prof Madelung stepped down to head the military aircraft division. "I'll never be able to build an aircraft," Dr Vogels said in January, "But when I've done some homework and know the company, I'll market MBB products as the best in the world."

ducts as the best in the world."
However, the problems do not stop here and the states will probably have to accept a further reduction of the workforce of about 2,000 by 1985. "I can-not promise miracles for the

workforce, least of all in the sbort term," Dr Vigels said.
One problem is that MMB is caught in the cycle of defence expenditure, and new procurement decisions must be taken by Bonn at once to maintain capacity in the second but in capacity in the second half of the 1980s.

Production of the Tornado multi-role combat aircraft, a joint venture with Italy and the Joint venture with Italy and the UK, has been cut by a third at MBB to meet Bonn's tight purse. The Luftwaffe allotment of 324 aircraft will probably be complete by 1988 and all hopes for keeping the MBB line at Manching onen will depend an ing open will depend on

What is needed, MBB officials say, is a speed decision from Paris and Bonn to go ahead with the joint PAH-2 military helicopter project and move-ment on a new European fighter aircraft for the 1990s.

Aerospatiale and MBB com Aerospatiale and MBB com-pleted a definition phase for the attack belicopter last year, but there remain differences of opinion between the two armed forces over the role of the air-craft, the French insisting on a heavier anti-helicopter and general purpose ground-attack general purpose ground-attack machine while the Germans want a simpler update of the PAH-1, based on MBB's BO-105 civillan helicopter.

The hope is, however, that political will in Bonn for a new joint project with France could overcome the differences over specifications.

If a decision is taken this year, delivery of about 450 aircraft could begin in 1986.

The difference in requirement

The difference in requirement for a new European fighter aircraft are even more marked although it is now thought in. probable that Germany could go it alone with ats own fighter to replace the F-4 Phantom for the Luftwaffe in the 1990s.

Both MBB and Dornier, which worked with Dassault on the Alpha Jet, are developing concepts and there have been talks between the governments of the UK, Italy and West Ger-many towards finding a joint basis for an Agille Combine Agr-craft (ACA) for the 1990s MBB has developed a carbon-fibre fuselage for its proposed model. But what will eventually emerge in the European skies in the 1990s is far from clear.

Intense battle to hold on to sales

Netherlands

FOKKER, THE Dutch aero space group, has spent much of the last 12 months taking a song, hard look at itself. The period of reflection has done it no harm at all.

no harm at all.

At the beginning of 1982, the company was on the floor. The McDonnell-Douglas link that was to have transformed the Dutch group into a volume. manufacturer of large, medium-range circraft had been severed: the F27 and the F28 severed: the rz/ and the rzo were going grey around the muzzle and the British Aerospace BAe-146 commuter liner looked like taking off into a bright future—at Fokker's

Nor did the 1982 financial results give much cause for cheer. Although turnover increased by 4 per cent, to Fl 1.35bn, operating profit remained stock at Fl 16.8m, and remained stuck at FI 10.8m, and a 250 per cent surge in financing costs left the company with a net loss of FI 10.2m. At the same time, as customers found themselves unable to take delivery of aircraft ordered, stocks rose alarmingly and dismissal notices were sent to 1,400 employees.

What happened next probably can be put down to experience and a wonderful concentration of minds, Fokker's senior man-agement, under the redoubtable Mr Frans Swarttouw, decided to press hard for sales of the F27 and F28—new versions of which seem to come along every three months and at the same time looked ahead, both into the middle distance and into the 1990s, for projects which would restore the dynamics of a somewhat moribund company.

Spirit

No magic wand was waved (Fokker still has serious probtems to overcome), but something of the old spirit was revived, so that managers, the U.S.-designed fighter, now but, like Fokker, is involved as workers began to feel that recovery was a practicable and to set of the control of th recovery was a practicable pro-

Sales first. Last year, Fokker sold 12 F27s (16 in 1961) and 22 F28s (13). Of the F28s, 10 were ordered by Garuda, the Indonesian state airline, which has for years put its faith in Fokker and which probably did more than any other customer to ensure that the puriference at more than any other customer to ensure that the workforce at Schiphol was not cut back further than it was. A total of 752 F27s has now been sold to 160 operators in 61 countries, while 206 F28s have been handed over to 47 operators in 32 countries. 32 countries.

succeeded in selling three of its type 4000 F28s to East-West Airlines of Australia, another customer with which it has a long association. It had been feared that the BAe-146 would usurp Fokker's position here, but the availability of stock aircraft—a bonus from the recession—plus the fact that the East-West that their venerable product was as technologically advanced as its rival, finally gave the F28 the edge.

Fokker is particularly pleased with the East-West with the East-West deal. British Acrospace pulled out James Buchan all the stops in Australia, but

ing claims on to their potential customers' desks with unrelent-

ing industry. Fokker agrees that the 146 is quieter—it may indeed be the least noisy airliner in the world -and accepts that this is an increasingly important factor. But it insists that the F28 is shead in the fields of suel consumption and maintenance.

To keep the F27 and F28 up to date its a perpetual process, and the makers say that both aircraft bear only a superficial resemblance to their original designs. Large sections of both have for some time been made of glass fibre composite materials, but a new etructural composites plant was opened at Hoogeveen last September with a view to further improving the process and both lightening and strengthening tha materials.

The company expects that the new technology of advanced three returns and the process and the pr

the new technology of advanced fibre reinforced plastics will play an ever-increasing role in future aircraft structure. Avionics are also being improved, while in the vital field of engineering Fokker is building on its established relationship with Rolls-Royce and, simultaneously, encouraging Pratt and Whitney to come forward with alternatives. with alternatives.

But if Fokker is enjoying a degree of recent success on tha sales front, it has also had to take on the tricky problem of buy-backs. East-West, in addition to its F28 orders, is to buy six of the latest F27s. The snag is that the Australian is that the Australian venture made the trade-in of 10 older type F27s part of the deal. Garuda similarly handed back 20 of its older F27s, and the result is that Fokker takes one step forward and trade-instep forward and two back Somehow, homes have to be found for all.

being assembled at Schiphol.
F-16 technology, and tha
management techniques re-

The fighters, among the most

we still came out shead," one senior manager remarked. That being produced for the Dutch is certainly true. BAe and and Norwegian air forces, but Fokker have been engaged in there is also a strong expectation while distinct the U.S. Air Force in Europe will have its F-16s Europe will have its F-16s maintained and repaired by Fokker. This could prove very

lucrative.
Fokker's on-off involvement in the European Airbus project has settled down in the last few months. Six months ago, Mr. Swarttouw said that he wanted to join the consortium building the new A-320 Airbus. Moreover, he wanted substantial participation, 15 per cent was not enough. "It is precisely what I don't want, it is too little," he said.

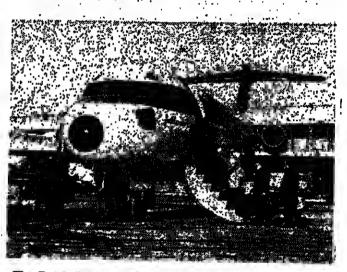
Now he has backed off, no Now he has backed off, no longer convinced that the 320 will secure a big enough place in the world market. He is apparently content, for the moment, to remain associated with Airbus Industrie through the manufacture by Fukker of carbon fibre landing doors for the A-300-600 and wing parts for the A-310.

the A-310. Looking to the future, Fokker is carrying out preliminary research on a new generation propellor-driven aircraft, which could fly as fast as present-day fan-jets but at half the cost in terms of fuel, A prototype could be ready within the next few years, ready for sale in the

1990s. Fokker's Fokker's other concern, beyond aircraft, is satellites. The European Infra-Red Astro-nomical Satellite (IRAS), on which it worked in the Netherlands slongside Philips, was launched into orbit in February and is now operational. All is well, and the unique telescope the satellite employs for its survey of infra-red sources the universe, could remain in space for 300 days instead of the 200 originally planned.

activities is widening and both quired for military production schedules, are proving of great benefit to Fokker, and the assembly line itself employs about 1,300.

Walter Ellis



The Dutch Fokker F-28 twin-engined Fellowship is one of the most successful jet airliners in production today, with orders for more than 200 aircraft, of which over 180 have

Component maker feels the chill

where. When these groups feel the cold of recession, the Belgian industry has to wrap itself to warmly. Over the last year it has felt the chill as military aircraft buying plans have been spread out and as the civil air international zerospace community by virtue of its wide range of activities. These extend through final assembly of advanced military aircraft such as the U.S. General Dynamica F-16 fighter, the manufacturers bave played a more dominant part in the bus, equipment for space of parts for the European Aircepture and advanced metals and the collaboration of business for Belgian companies engaged in offset arrangements.

Called Flemish Aerospace Group (Flag), has been set up to marshal the efforts of small and large companies alike and to undertake marketing work.

Fing is now claiming that in future aircraft deals the offset arrangement should be 100 per cent Flemisb. The claim is based on the longstanding demand for a greater share of central government and industry hargely took advanced military aircraft such as the U.S. General Dynamica F-16 fighter, the manufacturers bave played a manufacturers bave played a manufacturers bave played a more dominant part in the business coming in abroad, it is discovered in Belgium and Danish afr for the Belgian and Danish afr forces.

Equality

Equality

The early postwar development for space and the manufacturer in the fine provision of business for Belgian and Danish afr forces.

All three of these companies alike and to marketing work.

Fing is now claiming that in future aircraft deals the offset arrangement should be 100 per cent flemish. The claim is based on the longstanding demand for a greater share of central government spending to be placed in Flanders.

As the region has more people and makes a bigger contribution to mathematical provision has more people and makes a bigger contribution to mathematical provision has more people and makes a bigger contribution to mathematical provision has more people and makes a bigger contribution to mathematical

three major companies — Société Anonyme Belge de Con-Aéronautiques (Sabca), and Societé Nationale de Construction Aérospatiale (Sonaca), on the airframe side, and Fabrique Nationale Herstal and resorque Nationale Herstal (FN), on aero-engines. These are supported by a wide range of ancillary equipment, component and electronics com-

The wing alats for the A-310
Airbus are made by Sonaca in
Belgium and sent to Bremen,
where they are fitted to the minutes of the sent to Bremen.

sectronic systems for military indicated industry has been the industry has been the decision of the Belgian Government to buy 44 F-16 fighter aircraft, made by General Dynamics with engines from Pratt and Whitney, from the

But 58 per cent of the value of the aircraft will be offset by manufacturing and assembly in Belgium. Most of this work will be done in the French-speaking area of Wallonia, the heart of the Belgian aerospace industry.

There is another.

The general with the U.S.

however. It is a 22 per cent indirect offset for the Fleanders. The trouble taken to reach this speaking area of Flanders. The found and seek to participate of the Giffset agreement it has for the Flood be worth some offset agreement it has for the Belgium and seek to participate in international programmes in internat

Because the greatest share of the work in the past has gone into Wallonia so in the future more should go to Flanders to achieve equality of regional development.

In the longer term, however, Flag is hoping to encourage joint ventures between Flemish companies and overseas groups so that a transfer of technology will be achieved eventually leading to greater indigenous research, development and manufacturing.

All three of these companies

stand to gain from the decision to purchase the second genera-

tion F-16.
But for FN this is not sufficient. Europe, the group notes, is simply not a big enough market to sustain its engines division. Yet in the case of the F-16 engines its destiny is to a large extent out of its hands.

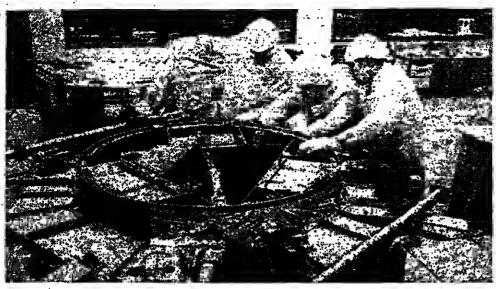
The marketing of the F-16 is a U.S. affair and the difficulties of the recession have been foreling governments to stretch out their buying programmes. FN is looking increasingly to the U.S. both for machinery and for engine maintenance.

manufacturing.

But this general policy has for years been followed by Gebecoma, the federation of Belgian aerospace constructors. The organisation has 10 members of which five are in any case members of Flag.

ACEC, Bell Telephone, MBLE, OIP Optics and Sait Electronics.

Flag believes that the indirect their buying programmes. FN is looking increasingly to the U.S. both for machinery and for engine maintenance. So its strategy to come through the years to 1986 is to win work from the U.S. Air force while awaiting the start of work on the new aircraft for Belgium and seek to participate in international programmes.



JAS project is largest ever defence contract

Sweden

Frience Figure F

To the Mete

The trace of

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Halle 🖽

FOUR YEARS AGO, the Swedish aerospace industry had neither a continuing military construction programme nor a commercial one; but the climate has changed.

Last year, the industry won Last year, the industry won an order for Sweden's next combat aircraft, code-named JAS 39; a consortium former between SAAB-Scania and Fairchild Industries of the U.S. has flown its first regional airliner, the twin turbo-prop SF 340, with deliveries due to start next spring. Sweden to start next spring. Sweden is also preparing to move ahead on a Nordie telecommunications satellite known as Tele-X; and its Viking space research satellite is mpleting final testing at the European Space Agency.

The JAS project is the largest defence contract ever placed with Swedish industry. It calls for delivery before the year 2000 of between 130 and 140 aircraft with wea-poury and equipment, Total value is SKr 24.9bn (\$3.3bn) at 1981 prices. The operating life of JAS is planned to ex-tend well into the next cen-

tury. An initial SKr 10bn contract for production of the first 30 aircraft was awarded by the Swedish Defence Maierials Procurement Agency to a special aerospace industry group headed by SAAB-Scania

was pushed through Parlia-ment last year despite opposi-tion by the Social Democrats, who were sympathetic to con-cerns that the aircraft might become obsolete within its operational lifetime. Once in power, they gave their stamp of approval following an in-vestigation which dispelled

lingering doubts. However, the programme's

cost was reduced by SKr 800m to the original esti-mates, and Parliament has insisted on strict adherence to budget targets. The June 30 budget targets. The June 30 contract spells out penalties if the single-engined aircraft fails to meet performance, operating and maintenance standards. Mr Anders Thornberg, the Detence Minister, stated in recent Parliamentary discussion that it might be necessary to delay pur-chase of about 10 aircraft to stay within target.

The JAS programme was chosen against competing American proposals. It has saved SAAB-Scania's ability to design and produce its own military aircraft, as well as 6,000 of 13,000 jobs in the aerospace industry.

Systems

The JAS Industry Group includes SAAB-Scania which is responsible for about twothirds of the work. It will handle the airframe construction and systems integration. Volvo Flygmotor is co-produc-ing the F-404 engine, which powers the F-18 Hornet, with General Electric of the U.S. General Electric of the U.S. The Ericsson Telecommunications group is producing the radar, sensor equipment, target acquisition systems and

cockplt displays.

The aircraft has been designed to carry out attack, intercept and reconnaissance missions. Like its predecessors, the Viggen and Draken, it is built for simple maintenance, but is less dependent

equipment.

To avoid a rush development programme, SAAB-Scania signed a contract with British Aerospace last December. BAe will design and produce the load-hearing section of the wings to be used on the four prototypes.

SAAB will take over during production build-up in the early 1990s.

When the predecessor to the current JAS development programme was cancelled by the Government in 1979, the SAAB Board resolved to cut his dependence on military contracts. The result was the SAAB-Fairchild joint ven-ture for the 24-seat SF-340

ture for the 34-821 SF-340 regional airliner.
The first prototype made its maiden flight from Linköping, Sweden, this January, exactly three years after the programme was initiated. A second aircraft is joining the test schedule in May and a third in August August,

This the first airliner This the first airliner designed to meet both U.S. and European standards, according to officials who hope that it will receive simultaneous certification when it reaches 1,000 hours of flight testing. Deliveries of the first 30 aircraft are planned for soon afterwards, in spring 1984. in spring 1984.

The SAAB-Fairchild group has set up a finance company with Ciribank as the lead hank, and a new marketing arm. It announced the loss of 10 orders in the U.S. Late last year due to poor economic conditions, and has re-esti-mated its firm orders at 100

With an anticipated upturn, officials bope the SF-340 will be able to capture a sizeable share of a market they estimate at between 1,500 and 2,000 aircraft by the year 2,000. The break-even point is 200 aircraft at \$5m each at 1982 prices.

On the space technology side, the Swedish Parliament is expected to approve a Bill allocating funds for a Nordle telecommunications satellite project known as Tele-X. Initial start-up funds would be Skr 575m, with an estimated total project cost of Skr L3bn to be shared with Norway and possibly Finland.

David Brown

Industry hopes for bright future

Israel

THE SUCCESSES of the Israeli Air Force in the Lebanese war against Syrian aircraft and ground defences, and the recent U.S. decision to release sophisticated technology for incor-poration in the new Lavi fighter, bave raised hopes for a bright future for Israel's aero-

a bright future for Israel's acrospace industry.

Inquiries about such items as
the Israeli-made pilotless drones
and electronic warfare equipment have brought new orders
which, it is hoped, will help
the acrospace and allied industries recoup some of the losses of last year.

Israeli Aircraft Industries (IAI) dominates the business and is also the country's bigges company in terms of sales, exports and number of employees.

Among its 350 products is the
Kar jet fighter which performed creditably as a ground
attack aircraft in the Lebanese war. The latest in the Kfir line is the C7 with improved per-formance and upgraded

avionics.

However, despite persistent reports of pending deals to sell the Kfir to one country or an-other, the latest being Hon-duras, there is no confirmation that any of these deals has been

After a particularly good year in 1981-82 when total sales reached a record \$822m and exports grew to \$517m, the company's financial report for 1982-1983 is expected to show almost a 10 per cent decline in sales and exports as comprising less than 50 per cent of total sales. One of the first ections of Israel's new Defence Minister, Professor Moshe Arens, a for mer deputy Director-General and head of the engineering department at IAL, on taking over in Fehruary was to an-nounce that the \$210m for Lavi development this year will be provided out of the defence budget.

Willing

Development of the Mach 1.8 Lavi, whose first flight is scheduled for the end of 1985, gives a much needed boost to IAI which, without this project, would have faced a gradual dedown of Kar production in the coming years.

The Israell Air Force is will ing to take 300 Lavis which is expected to provide employment for 12,000 people. Looking re-markably like the F-16, but with canards, the Lavi's primary function will be close and medium range air-to-ground missions with a secondary air

defence role. Beth Shemesh engines, origin ally set up by Turbomeca, is already tooling up to produce the Pratt and Whitney PW1120 engine which will power the Lavi. Like IAI, which wanted the engine too, this contract probably saved Beth Shemesh from an increasingly perilous

The recession in the West which hit the business aircraft market, also spelt bad news for IAI's Westwind executive jet whose sales fell last year. But the company is more optimistic about its new generation West-wind Astra which is due to roll out of the hangar in September this year, and go into produc-tion in 1985. Already it has orders for 20 Astras, mainly from buyers of the earlier West wind models.

Israel's Arava Stol aircraft has still failed to live up to marketing expectations, ever though about 60 of them are already operating in central and southern America. IAI is still pursuing sales for this aircraft, but there are considerable doubts that it will ever return its development and production

IAI reports deliveries of the

from EFIM to the But the in service with the Argentine scheme seemed somewhat improbable from the outset, above all because of the rivalry between the two companies and their two parents.

EFIM in particular, would the Navy's desire to buy the love particular, the Navy's desire to buy the love particular.

Agusta rose from 51 per cent to 80 per cent. The remainder is in the Lebanon war, was unveiled this year by Rafael, the Defence Ministry's armaments would like to sell out.

Whatever happens some form infra-red detector of the Python allows it to be fired from "practically any ing to Rafael Director Mr Zeev Bonen.

David Lennon

Three words that almost cover the earth

MACRODYNE-SOVAM INTERNATIONAL

Those three words stretch across five continents. They make up the name of a new joint venture between Macrodyne Industries of the United States and Sovam S.A. of France.

MSI now offers airlines and airports the broadest range of ground support equipment from any company, anywhere.

The equipment is presently manufactured in France and will also be manufactured in the U.S. by Macrodyne Industries Inc. It is now being used at over fifty airports throughout the world. under all climatic conditions.

All of it is rugged; able to stand up to demanding airport use. Mechanical systems are easily accessible. The body is made

of modular, removable sections for easy replacement. Electrical systems are based on solid-state. plug-in circuits for quick repair. Al in all, it's designed to be-and has proven to be-efficient and economical to operate.

The most unusual feature of the equipment is the broad backup from MSI. Dual warran-ties. Comprehensive, on-site training, service and maintenance programs. Long or short term leases. Full financing plans, Turn-key packages. Round-the-clock technical assistance. Quickly available spare parts.

Macrodyne-Sovam International, Three words worth storing in your memory for when you need ground support equipment.

Visit MSI at Le Bourget Air Show

It's the bottom line

Difficult year ahead

Italy

ITALYS AEROSPACE manufacturers are now coming to terms with an unaccustomed circumstance — that 1983 is likely to be a difficult year for the industry. Until now, aerospace has been

one of the quieter, but none-theless genuine, success stories industrial landscape dotted by such disasters as steel and chemicais, both regularly losing hundreds of billions of lire annually.

The zerospace sector's total

turnover has climbed from L740hn (\$507m) in 1977 to L2,200hn for 1981, of which three-quarters went for export. Final figures for 1982 have not yet been prepared, but a further substantial growth is likely to

summer onwards. The reasons are familiar: the acute financial difficulties of elvil airlines (which have already been cutting back orders), the short-orders for 266 of the aircraft. age of available finance for to be priced at between \$8m and potential buyers from develop- \$10m each. The first test flight

All this, however, is for the future. The results thus far reported for 1982 by Italy's major aerospace manufacturers suggest that the uptrend, until then, continued. Aeritalia, the country's leading producer and illustrate one of the personnial problems faced by the industry. subsidiary of the huge IRI- problems faced by the industry Finmeccanica state-owned con-glomerate, announced that sales berent in Italy's rusty adminishad risen by 52 per cent to trative machinery. Failure of 1800bn (\$570m) and that net profits would be double the materialise has led frequently 1.2.2hn achieved in 1981. Orders in hand at the end of last year on expensive borrowing from

reported a comparable advance in turnover to LLSSbn (\$126m). Final agreement on the project and earnings of "several billion to build a new range of belilire." A healthy expansion in copters, the EH-101, in conjunction with Westland of Britain,

Agusta, the second-ranking com-pany in the sector, controlled by EFIM, another state-con-trolled industrial holding com-

The activities of the aerospace sector are of a breadth reflecting the profound change it has experienced since the mid-1970s. Italy's manufacturers used to be specialists, concerned with marginal and basically with marginal and basically small-scale programmes. Today, they are key participants in several of the largest inter-national projects under way—in

largely generated abroad.

This year, bowever, may well see problems, especially from summer onwards. The reasons are familiar: the acute financial difficulties.

potential outers rum develop-ing countries and the scarcer of the AMX is due by the end resources of oil producer of this year, and the main con-nations, are leading them to cern of the manufacturers is slow down their expansion prothe Italian Parliament (now dissolved ahead of the June

-the bureaucratic obstacles inin the past to a heavy reliance stood at L1.550hn (\$1.07bn).

Aermacchi, the smaller
Varese-based concern, of which
Aeritalia now bolds 25 per cent,
involved itself on the military banks, and the ensuing burden Agusta, of course, is heavily involved itself on the military side, especially in helicopters. Final agreement on the project

is expected shortly. In the meantime, its subsidiary, Siai-Marchetti, is promoting its S-211 military light trainer. The most striking civil in-volvement remains Aeritalia's

important role in the Boeing 767 programme, which is likely to be a backbone of the com-pany's activities for several years. But progress on the ATR-42 short haul "commuter" alreraft, on which it is cooperating with Aerospatiale, its French opposite number, is also running smoothly and ahead of schedule.

meids.

The most eye-catching military programme is, of course, the Anglo-German-Italian multiple Tornado strike aircraft, in which Aeritalia is the Italian scheme and abroad. An example of the latter the Anglo-German-Italian multirole Tornado strike aircraft, in
which Aeritalia is the Italian
partner, and of which 100 bave
been ordered by the Italian Air
Force. But considerable bopes
are pinned on the new AMX
representation of the competition
light attack and battlefield suprout disperse heing developed. for the new generation of 150-

seat airliners.

At bome, too, the success of the secrospace industry has focused attention on the need to reorganise its structure. A first step was the acquisition by Aeritalia of e minority interest in Aermacchi. Far more important is the future relationship between Aeritalia and Agusta. Last year, Sig Glammi de Michelis, the outgoing Minister for State shareholdings outlined a plan to effectively merge the two hy the transfer of control of Agusta from EFIM to IRL But the scheme seemed somewhat im-

be unhappy to lose perhaps the Israeli weapon best asset it has. After a capital A new Israeli best asset it has. After a capital increase from Light to Lilghn, missile, Python 3, which brought down several aircraft

Whatever happens, some form of truce between the two companies is required—if only to remove wasteful competition between them. Rupert Cornwell

laal Coo deHAVILANT and plenty of headroom. With large

but

Australia

industry

ALTHOUGH IT is one of the smallest aerospace industries in the world, with a total labour force of about 6,000, the Australian industry is nevertheless highly active.

In recent years this activity has been concentrated primarily on the provision of equipment and services to the Royal Australian Air Force (especially in the modification of and "life-of-type" extensions for training and combat aircraft in air force service), and in the manufacture of components and assemblies, especially for foreign aerospace manufacturers in the UK, U.S. and Western Europe.

The industry is con-centrated around three major companies — the Common-

wealth Alreraft Corporation (CAC), of Melbourne; The Government Aircraft Fac-tories (GAF), (which is part

ories (GAF), (which is part of the defence production facilities owned by the Australian Government), of Fishermen's Bend, Victoria; and Hawker de Havilland Australia (HDH), a member of the UK Hawker Siddeley Group, of New South Wales.

The CAC is currently

engaged on extending the lives of RAAF Aermachi MB-326H trainers and modify-

ing the Lockheed P-3C Orion

for Australia's long-range maritime patrol requirements,

and is also involved in the repair and overhaul of BAAF Mirage fighters and Atar 9C,

Viper and Avon zero-engines.

clade parts for the Nomad light transport built by the

Government Aircraft Fac-tories, passenger doors for the Lockheed TriStar airliner and escape slides for the McDonnell Douglas DC-10,

The Government Aircraft

Factories are currently engaged in the manufacture

of the Nomad series of light transport aircraft, which is in

service worldwide in a variety of civil and military versions, with total sales of well over 150 zircraft. Production of the Nomad is due

to end in 1984, after the com-

The GAF is also busy, however, on manufacture of the Ikara anti-submarine missile and Jindivik target drane; and on wing flaps for the Dutch Fokker F-23 Fellowship

airliner; while it is also undertaking final assembly of

all but the first two of the 75 McDonnell Douglas F/A-18

Hornet strike fighters ordered for the RAAF.

Hawker de Havilland's major activities continue to be in component manufacture

and the provision of overhaul, modification and repair and

maintenance services for the Australian defence forces,

and for a wide variety of other Australian and overseas

All three of the main Australian companies—CAC.
GAF and HDH—have joined in the formation of a new

Whitney and Helicopters.

Overhaul

Manufacturing activities in-

Successes and constraints

Brazil

WITHIN TWENTY years the Brazilian aerospace industry has grown from scratch into one of the most diversified, and successful, in the developing

However, it has also suffered periodically from financial con-straints. In recent years these have worsened, forcing e greater emphasis on the development and export of highly-profitable equipment.

Success came originally for Brazil from the adoption of tried and tested principles—learnt from the experience of others—and then their consistent application, with military order and directness.

A mastery of relatively un-sophisticated evlation tech-nology in the 1960s and early 1970s provided the foundation stone. A twin-engined turbo-prop, the Bandeirante, was e surprising success, both at home and abroad.

Licensing arrangements with two foreign manufacturers—
Piper, in the U.S., for light
passenger aircraft and
Aermacchi of Italy for military jets—became another platform for the development of an

indigenous industry.

The decision to rely on one supplier, Pratt and Whitney, for most engines powering Brazilian-made aircraft may have been a little risky for a Government emphasising the national independence aspect of its approach to the industry. But the edvantages of cost and But the edvantages of cost and standardisation were clearly

judged to be more important. Brazil's military-led Government has always played the leading role in this field through, for example, its control of Emhraer, the major manufacturer of civil and military aircraft.

Strategy

Equally important was the way in which it implemented during the past decade the straightforward strategy of closing the doors to foreign competition, and then sending out the salesmen in search of foreign markets as soon as Brazil had tested products to

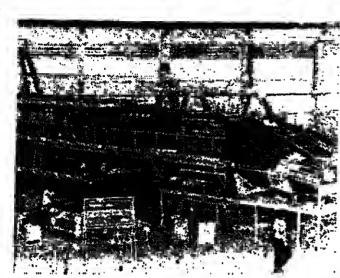
The Brazilians' highly protectionist attitude towards their domestic market still rankles with Western competitors, who see Embraer in particular making inroads ento their tradi-tional markets abroad.

The U.S. continues to press American commuter sircraft Brasilia.

whenever possible. On the other hand, its international trade commission last year came down in favour of Embraer's exports to the U.S. of the Bandeirante, against an anti-subsidy case lodged by its competitors.
In fact, Embraer depends to

a considerable extent on foreign technology and components. Its In the meantime, the less-most ambitious new venture, a supersonic interceptor aircraft Embraer'e production line has

The new aircraft, which marks its own design, the Tucano, to Embrace's entry into the world Britain's Royal Air Force. market as a major manufacturer, is due to test fly next month and come into eervice sometime next year. More than 150 edvance orders have already been placed but it daces strong competition abroad.



The Brasilia is the new 30-seat twin-engined transport air-craft now under development by Embraer, with a maiden flight scheduled for midsummer.

An everage of 60 per cent of the company's components are Imported — a percentage which rises sharply in the case of its more sophisticated military air-

The industry as a whole remains relatively undeveloped, dominated by Embraer and Avibras, a privately-owned missiles and rockets company. One major area of potential future growth is helicopters, where the only significant com-pany today is a small joint venture between Aerospatiale and the Minas Gerais State

After good growth in the past decade, the Brazilian industry's domestic sales bave dropped off badly recently and the outlook remains hleak.

Over half Embraer's annual sales of approximately \$250m come these days from exports. On the civilian side the mainstay remains the sturdy, economical Banderante. But this will soon start to be phased out in favour of Brazil's first pressurised aircraft for the air-line industry, the 30-seater

known as the AM-X, is a joint been growing rapidly. It project with Aermecchi and probably now represents the bulk of the company's earnings. elthough exact figures are hard

Considerable secrecy sur-rounds Brazil's sales of military aircraft. An Embraer docu-ment reveals that up to 1981 at least 71 military or dual civilian/military purpose aircraft had been exported by the company. But the total could now be significantly higher.

After repeated denials by the foreign ministry in Brasilia, an enterprising Brazilian news photographer was recently able to confirm reports that Brazil has sold 12 Xavante ground-attack aircraft to Argentina. His photograph showed the aircraft in Argentine Navy colours on Embraer's airfield at Sao Jose

emaraer's airfield at Sao Jose dos Campos, bome of the Brazilian aerospace industry.

The Xavante, a version of Aermacchi's M-326 aircraft, powered by a Rolls-Royce Viper turbojet, is known to have been sold to a number of other Latin American and African countries. But the African countries. But the approach, Argentine sale was particularly point to sensitive, as it comes at a time staggering when the Brazilian company is 10 years. trying to sell a turboprop trainer/light tactical aircraft of

Argentina, along with all the other Southern Cone countries, has also bought the maritime patrol version of the Bandel-rante, the EMB-111, which is stuffed full with U.S. and

French defence equipment. Not surprisingly, Embraer has been keen to keep a low profile lately. The face of what could be its largest ever single eale—a \$200m order from Libya for 150 Tucanos and 10 EMB-111s—bas been hanging in the balance ever since Brazil last month seized Lihyan armstransporting aircraft on their wey to Nicaragua.

Hard hit by high domestic financing costs and a temporary halt in its sales to the U.S. last year as a result of the ITC case, Embraer badly needs the Libyan order. Despite its im-pressive growth, the company's balance sheet has not looked healthy in the past few years.

Priorities

An additional source of strain is the development costs of the AM-X. Total investment was estimated two years ago at \$600m and Embraer bas to find a third of that sum.

The recent shift in Brazilian aerospece priorities, awey from its embryonic space research programme and into the export of military equipment, is illus-trated by the changes undergone by Avibras.

Founded in 1961 as a wbolly privately-owned company, Avi-bras was seen as the main local manufacturer behind the country's \$850m drive to put its own satellite into space. A two-stage, solid-fuel rocket developed by Avibras, Sonda-4, is intended to be the launching vehicle.

However, budget cutbacks and Brazil'e current severe financial plight affected plans at the Institute of Space Research at Sao Jose dos Campos. Instead Avibras is these days putting much more emphasis on its military rockets, which have sold well

in the Middle East.
In Paris this mooth the pride of the show for the Brazilian company will be its latest multiple rocket launcher system, Astros-II, which it claims will be a world beater.

Avibras has grown rapidly over the past four years on the strength of its military exports. And if any further proof were needed of the success of this approach, the company can point to orders totalling a staggering \$1bn over the next

Andrew Whitley

Modest increase in production forecast for 1984 Small Expansion levels off diverse

Production, however, is likely to expand much more slowly in the current year and prospects beyond the middle of 1984 are uncertain, to say the least. The much discussed "take-off" of the Japanese aircraft industry, accordingly, has yet to materialise, and may not do so

for some time to come. From 1976 until 1980 output of aircraft and related products by the 30 companies that are involved in the Japanese industry fluctuated between Yen 250bn
(\$1.08m) and Yen 250bn
figures that place the industry
well behind those of the UK, France and West Germany. In 1981 output rose to Yen 327bn and during the 12 months ending last March there was a further sharp rise to Yen 440bn.

This reflected the start last year of full-cale production of year of full-scale production of two new aircraft intended for

Japan's self-defence forces to-gether with the Japanese share gether with the Jepanese share in the Boeing 767 project.
The defence aircraft which belped to beost production last year were the F-15 fighter and the P-3C anti-submarine aircraft both of which are being manufactured in Japan under licence from the U.S. Defence sources say that full-scale pro-duction of these two aircraft

started in 1982. In 1983 Japanese aircraft

FROM REMAINING almost a long range "vision" for the major new aircraft developstationary in the second half industry believes that a decision ment materialises.

of the 1970s aircraft production on the projected 150-seater Although some 30 companies in Japan grew very sharply in civilian aircraft known in Japan are covered in statistics col1982 as the industry embarked on three major new projects.

Production however is likely to the industry's future in the midTapanese Aerospace Companies. the industry's future in the mid-1980s. It does not believe, how-ever, that either Japan or

> a key to the future growth of the Japanese industry since it represents the main hope during the next few years of reducing the industry's depen-dence on defence orders. These currently account for just over 80 per cent of total production, despite continuing efforts by manufacturers

Japan

Mitsubishi has sold more than 700 MU-2s, a 10-seater turbo-prop aircraft, but suspended production temporarily last summer after a sharp fall in orders from the U.S. Production of the MU-300 business jet continues but Mitsubish's order backlog had manufacturers are continuing Production of the MU-300 work on the F-15 and the P-3C at levels that ere slightly shove last year but work on the fuse-lage of the Boeing 767 has diminished in line with the decline in orders from airlines. The industry is thus forecasting month from its Nagoyo aircraft armodert increases in proa very modest increase in production during the current fiscal
year, to perhaps Y460bn.

The Society of Japanese Aerospace Companies, which has
been working for some time on

the industry is dominated, on the mainframe manufacturing Boeing (the company expected side, by just four: Mitsubishis to lead the project) will be ready to go sheaf for at least another one to two years.

The XXX project is seen as a key to the future growth of the Japanese industry since it.

cent of its sales, none of the four is predominantly a manufacturer of aircraft. Apart from their role as sirframe makers Mitsubishi and Rawasaki double as aero-engine man-uracturers, while a third major heavy industry company, Ishi-kawajima-Harima, is also involved in engines.

All three of Japan's top aeroengine manufacturers participated in talks with Rolls-Royce
on the projected XJ-500 engine
which began in 1980. Early this
year Japan agreed to participate in a wider version of the
XJ-500 project in which Pratt
and Whitney of the U.S. will be
irrollyed with Rolls-Royce along diversify into non-military production. Previous Japanese projects in the field of civil aircraft included the YS-11, a short famil 60-seat airliner of which 182 were produced from the mid-1960s onwards and the MU series of business aircraft manufactured by Mitsibishi Heavy Industries.

Which began in 1980, Early this year Japan agreed to participate in a wider yersion of the cost of the involved with Rolls-Royce along with engine manufactures.

Japan will bear a 23 per cent share of the costs of the replanned project. About that the Japanese contribution planned project. About half the Jepanese contribution is expected to be provided in the form of a Government subsidy. On its present scale the Japanese aircraft industry is very far from being one of the meinstream industries - comparable with say cars, or elec-tronics that support Japan's economy. The Ministry of International Trade industry sees sireraft as a future source of growth But MITT's attempts to boost the industry have

achieved modest results in the past and it seems cicer that the

real breakthrough in aircraft

Charles Smith

STOL project on time

Spain

THE CURRENT year is some-thing of a milestone year for Constructiones Aeronauticas SA (CASA), one of the smaller European aerospace companies, hut the virtual sole representa-tive of the sector in Spain.

An upgraded version of its remarkable successful short take-off and landing transport aircraft, the C-212 Aviocar, is due to roll out on schedule in early September and will make its malden flight the following

This new aircraft, called the CN-235, is the result of a productive 50-50 relationship between CASA and the Indonesian aerospace company, P.T. Nurtanio. CASA marketing executives talk of a potential market for the CN-235 of 1,800 civilian units and a further 600 for military use.

The new aircraft will be seek-ing to make its mark in a new area for the industry, taking on competition from De Hawilland Canada's Dasb Seven and Saab-Fairchild's SF-340 in the grow-ing commuter/utility aircraft

The CN-235, which is being

customers, both civil and military, including Boeing, British Aerospace, General Electric of the U.S., Lockheed, McDonnell Douglas, Pratt and Whitney and Westland built in both countries, is the offspring of the C-212 Aviocar. CASA, together with Nurtanio, has built on the marketing, design and mission knowledge design and mission knowledge acquired through the development of the sturdy, all-purpose Aviocar, an aircraft better known as "The Jeep with Wings." The two manufacturers are also counting on customers' loyalty to promote the sleeker CN-235, which is effectively a Range-Rover to the C-212 Jeep, and there are already firm orders for \$4 aircraft from Indonesia and a further 20 from Spain.

CASA's standard bearer, and

more than e year and the C-212's main rival for the order is the

A second important contract looming for the Aviocar could

come from the U.S. Air Force,

System Aircraft (EDSA) programme would be a crucial sales

breakthrough for CASA.

The SAR version is held up
by CASA as yet another
example of the multiple-role

adaptability of the C-212. Its civilian version can carry up to 28 passengers or loads of 2.8 toos (the CN-235 is designed to

ransport a maximum of 40 passengers using the more powerful GE CIT-7 engines

Battle

in the formation of a new company, the Australian Aircraft Consortium (AAC), with the aim of designing and developing a new turbo-propeller basic training aircraft, the A-10, intended to emer RAAF service in the late 1980s, while also serving export markets. The AAC will be the project manager for the £90m venture but will sub-contract all manufacturing activities to the three partner companies. Three prototypes and 69 production aircraft are plauned, with deliveries starting in 1988. that of the industry in Spain, however, rem i for the present the C-212. Some 241 Aviocars are currently opera-

In addition, the AAC is studying the possibilities of developing other types of training aircraft, with an advanced jet trainer for the RAAF for the early 1990s particularly in mind.

On the civil side, in addition to the already extensive sub-contracting work being undertaken by the major companies for e wide variety of international customers, it seems likely that the Australian industry will take a share in the development. a share in the development of any new international 150seater type airliners that may emerge in the future. The major manufacturers involved in planning such aircraft
Airbus Industrie, Boeing and
McDonnell Douglas—are all
believed to have discussed the possibilities of some Australian participation in their ventures, as and when they are formally launched.

Michael Donne against the Aviocar's Garret

from transporting patrols to ferrying essualties as a hospital aircraft, and from carrying vehiles to becoming an airborne command post or photographic mapping aircraft.

Last year was a good year as well for CASA'e third major product, the C-101 basic advanced jet trainer. So far, according to CASA, over 100 C-101s have been sold and 70 year was the sale of the trainer to two Latin American comthe product by the Spanish Air

CASA's sales staff are hoping for contracts this year from Singapore for e revamped C-101 that incorporates missile pods, and there are hopes of sales to Thailand and the Philippines, as well as to Indonesia.

as well as to Indonesia.

While Spain's aerospace industry, founded and rooted on CASA, in which the State holding company, INI, has e 69 per cent stake, is confident of its product line, there is an air of uncertainty over the future of its maintenance and repair division, and whatever may lie aheed in the field of technological co-operation.

This depends almost exclusively on its choice for a new combat aircraft for the 1980s and 1990s.

on its choice for a new combat aircraft for the 1980s and 1990s. Last year, 84 McDonnell Douglas F/A-18s were ordered by the then Centre Government, and a letter of intent was signed in December. However,

A perfection states fatch for the new sociation to contract in roles which allow it to switch order to take another look at Panavia'a Tornado fighter.

The poker game for the final contract has in practice meant at least the possibility of greater technological transfer to the national aerospace industry. Panavia's late bids have included a place for Spain in the consortium with Britain, West Germany and Italy. McDonnell Douglas, in turn, has been forced to increase its offers of

Decision

Whatever the final decision—and there must be one hy the end of May—CASA stands to gain. The original \$3bn order for the F-18As (the combat aircraft preferred by the Air. Force) bad the company quictly critical over the spin-offs. The re-entry of Panavia into the hidding and the strong line taken by the Socialist Administration on the transfers, has created an atmosphere of expectancy among CASA executives.

The Spanish Defence Ministry is also due this year to try is also due this year to decide on an ambitious missile programme in which CASA will be intimately involved. The choice is et present between the UK Rapier, the US. Chaperrel and the French Roland and, as in the case of the fighter contract, the competition is in Spain's interest. The entry by CASA into the missile sector will prove a valuable diversificawill prove a valuable diversifica-

GOULD

Tom Burns

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GUESTS OF THE Paris Air Show are... Condially Invited TO THE GOULD SUITE Avocars are currently opera-tional, according to CASA, and a total of 339 have been cold. The 1983 sales thrust is immersed in a battle to gain a major 200 STOL aircraft con-tract from India. The Indian decision has been delayed for Hotel Chalcan Frontenac Sun., May 29 to Thurs., June 2 5:00 PM to 8:00 PM which plans to buy a total of 18 light transport aircraft— two this year—to distribute spare perts and engines in Europe. A toe-hold in the USAF's European Distribution ould Inc., Defense Systems Group welcomes you to visit for business discussions and consultations. Appointments for earlier in the day may be arranged upon request, Please call Patricla Squires, Chateau Frontenac Hotel at 723-5585.

Charles Suit

Successful start for Hellenic venture

Greece

GREECE'S \$500m investment in high technology, Helienic Aerospace industry, is looking for a substantial boost from pending Government procurement contracts for the purchase of new fighter and trainer aircraft for the Greek Air Force.

for the Greek Air Force.
But already, in less than four years of operation, it has more than doubled its workforce and raised its foreign exchange contribution to Greece's balance of payments to \$130m in 1982, with 70 per cent represented by savings of currency outflows and the balance deriving from the sale of products and services to customers abroad. This year, it is forecasting a sales turnover up 20 per cent, as close on \$160m.

HAI came into operation gradually during 1979, in advance of a formal opening in December of that year. It is with 70 per cent represented by

December of that year. It is situated at Tanagra, 60 kms from Athens, on a site adjacent to an ancient Greek cemetery and a modern Air Force base.
Its objectives when at started were to give Greece cational defence self-sufficiency in the aviation field, and then to carve out a niche in the world market. The former has already largely been attained, in terms of overhaul and maintenance work for the Greek Air Force and the Army and Navy aviation services, permitting attention to be concentrated now on sion of manufacturing activities.

of total operations has aiready been raised from zero in 1979 to between 30 and 35 per cent now, with management confident that the figure will go above 50 per cent in the next five years. Much will depend on the offset and buy-back arrangements to be stipulated in the Governparcraft, and the degree of construction to be involved in the planned new trainer aircraft

Competitors

Greece is seeking advanced combat aircraft from the late 1980s onwards. The number involved has not been disclosed, but is expected initially to be about 60. Competing for the transport sireraft, with Agusta The Lockheed connection will for the complate cabins of an be re-examined through this west German-Italian consortium building the Tornado multi-role combat abreraft; McDoonell Douglas of the U.S. with its bus door frames assembly and HAI identifies its main bus for the u.S. with its bus door frames assembly and HAI identifies its main growth area as the military connection with the Mirage F-1, sector, with good prospects for the under the un

wants offset attraction of the aircraft, but collaboration has also been work from Olympic Airways, also a substantial share of other strengthened with Greek which has its own maintenance

director Mr Dennys LeonidisPlessas, said the company expected a reasonably high Greek the modernisation of the Greek
value added factor for the
fighter aircraft and also would
be producing buy-back components for the surveiller Astichneting in a number of interbe producing buy-back com-ponents for the supplier. As ticipating in a number of inter-regards the trainer aircraft, national programmes inside and

HAI would be the production chase of ready aircraft but at Stinger missile; maintenance buying manufacturing and design drawings and having the airframe produced and assembled here in Greece," he said.

The Greek Air Force has made a preliminary request for the U.S. After the Stinger missile, and repair of the contractions, communications, comm

51 trainer aircraft, but HAI ex-pects this figure to double over the first five years—apart from anticipated orders by the Army and Navy, possible other appli-cations that the aircraft may bave in Greece, and manufacture under licence for export

Readiness

When HAL was set up, Mr Plessas said, there were three besic goals: 1. To increase the opera-

tional readiness, technical auto-nomy and support self-suffi-ciency of the Greek Air Force and the aviation sections of the army and navy; 2. To save foreign exchange and increase currency inflows ("We have reached the point

where virtually no single com-ponent has to be sent outside Greece for overhaul by the Air Force or the aviation groups of the navy and army, while we have carried out maintenance on 24 different aircraft types"): To create an industry that

would become a pole of attrac-tion for technology and know-bow that could be made avail-able to other sectors of the

Greek economy.
"Today HAI is really a complex of five different factories, facility, Westinghouse Electric one for aircraft, one for accessories, one for electronics, one for engines and one for mann-tions, and construction design facturing." Mr Plessas said. "It and site supervision was the is a very good example of how a responsibility of the Austin country like Greece, which is company of the U.S. not industrialised to the Western European extent, can acquire needed technology, train a local workforce, and install modern management tech-

Concentration on manufactura realisation that there was no decision has yet been taken on their route to financial viability, whether to continue the Most of the manufacturing is relationship in its present or in one sub-contractor basis for air some amended form. HAI is now moving in the direction of ambieticated shorting developed gradually, out of

craft companies abroad, now moving in the direction of HAI now has manufacturing dexible sophisticated shortcontracts with Aeritalia for control surfaces, floor panels and
lower lobes of the Italian G-222
transport sireraft, with Agusta. The Lockheed connection will
for the complate cabins of an be re-examined through the F.A.18 Hornet, the U.S. General
Dynamics group with its. F.16
with Snecma for engine parts,
and the French Dassault Mirage
2000. A decision is expected
later this year.
In return for placing the
order, the Greek Government
wants offset arrangements covering not only participetion in the
in defence system.

also a substantial share of other already substantial share of other also a substantial share of other also a substantial share of other are substantial share of other are substantial shares and missile business, and assistance with industrial ments. One result of this is a activities of particular interest programme for the design and production of military telephone stritthhoards for the ground to the Greek economy.

Discussing the two programmes, HAI's marketing director Mr Dennys Leonidis
The Greek economy.

Droduction of military telephone switchboards for the ground communications needs of the Greek Army, and e basic con-

TO SQUEEZE greater efficiency out of aircraft by developing less thirsty engines and longer-range versions of existing models is now one of the top priorities of the Soviet aircraft industry and Aeroflot, the Soviet sirkine.

Two new aircraft, the flynchin 1.86 airbus and the Yak-42 in-termediate range tri-jet, are in serial production and steedily being introduced on new domes tic and international routes. Il-76 has proved a successful But new long-range and cargo model in export markets—pertiversions of the Tupolev Tu-154 cularly in the Middle East with tri-jet have also been introduced the result of the successful experience. duced this year.

outside Nato. These include the

"The growth has been dramatic, and has required very rapid learning by a workforce the average age of which is only 33," Mr Plessas says. "We managed to set a faster pace than we had expected originally because we were able to attract a large number of Greeks who were working abroad but wanted to return to their court countries."

to return to their own country-there's a lot of talent of this

kind spread all over the world."

This in turn has facilitated e programme of "Hellenisation,"

to the point that the foreign component of the workforce has

been cut from an original 15 per cent of 1,500 to a present

two per cent of 3,400.

Though wholly-owned by the Greek State and run from the beginning by a nine-member Greek board of directors, HAI

was set up largely with foreign expertise. Lockheed Aircraft Services handled systems and

equipment requirements, Lock-heed Aircraft International was

responsible for management and

control. General Electric of the

U.S. undertook the design and

Renewal -

Only Lockheed is

intimately concerned with operations, under a contract

dne for expiry or renewal at the end of this year. While no

The long-range Tu-154M is missile, and repair of the engines used in AWACS aircraft. Three major contracts with the U.S. Air Force relate to maintenance and overhaul of the J-79 engine, and electronic accessories and aircraft components.

"The growth has been dramatic, and has required very rapid learning by a workforce the average age of which is only 33," Mr Plessas sayz. "We managed to set a faster pace than we had expected originally because we were able to attract a CTUDES.

Freight is hig business for Aeroflot, which carried more than 30m tons during the last five-year plan and will carry more than 33m tons during the

Aeroflot, a state monopoly, is by far the biggest airline carrier in the world

Fuel efficiency emphasis

who are also big Soviet arms punchasers.

But Aerofiot still has a long But Aerosot stik has a long way to go before it comes near to matching the operational efficiency and standards of service offered by Western airlines. The number of aircraft operated by Aerosot is a secret. This is not surprising because Aerosot, like so many Soviet institutions, is a para-military orranisation. organisation.

Monopoly

It is also a monopoly. Anything which files in the Soviet Union is flown either by the military or by Aerodot. Thus the estimated 3,500 aircraft of various types in the Aerodot fleet range from light single-engined crop sprayers through be-copiers to the airbus. engined crop sprayers through
belicoptiers to the airbus.

There are no figures available for average zircrast utili
In many ways Aerostot is et

those. A whole stable of rug-ged, sturdy take-off and landing **Soviet Union** aircraft have been developed by the Antonov and Yakovlev design studios in particular. aircraft are to be seen standing Helicopters are also used ex-tensively for lifting heavy or parked on the ground at any one time. bulky equipment into drilling camps or construction sites in trackless tundra and perma-Relatively low epperent ntilisation rates are partially com-pensated for, however, by the fact that Soviet citizens are invetente aircraft travellers and most internal flights are frost

regularly fully booked. Indeed, many flights are overbooked. and gold as well as valuable ores like the which otherwise would be virtually untransportable.

The Soviet aerospace industry also casts envious eyes over the U.S. Space Shantle while its Domestic fares are still low by international standards. Over the current five-year

plan, Aerofiot expects to carry nearly 550m passengers, which makes it by far the biggest air carrier in the world. It is the epitome of the "no frills airline." On flights of less than \$1. bours massengers are lighty Soviet aircraft designers are very excited about the prospects for non-conventional aircraft—
especially hovercraft end eirships. Despite the obvious advantages of such craft in a
country with wast expanses of
permafrost, marshland end
tundra, the development of 31 bours passengers are lucky more than 35m tons during the feet range from light shake—
current plan. Capacity has been engined crop sprayers through to get e boiled sweet or e cup of such craft in a greatly increased by introduct belicopiters to the airbus.

There are no figures available for airlifting bulky sation rates but at Soviet air its best serving the remote such craft is facing bureanequipment and beavy arms. The ports a very high number of phoneer areas of the Soviet craft obstacles and industrial

daily newspaper, Sovietskaya Rossiya, lasi February. The Soviet Union, it said, is lagging far behind the U.S. and other Western countries in develop-ing the airship and claimed that government ministries had ig-nored requests for support from institutes and academic groups trying to put an experimental craft into service.

conservation.

No such problems appear to daunt the military side of the industry where new and up-dated fighters, bombers and cargo aircraft roll off the assembly lines like blini (Russian pancakes). According to American military publications, a major effort is now going into the development of a Soviet strategic bomber similar to the Officen the aircraft or helicopter is the only way to fly in workers and supplies to remote areas. Likewise in remote areas of Yakutia, for example, Aero-ahout the "Star Wars" space

This led to a dramatic "cri de coeur" from the Russian

also casts envious eyes over the U.S. Space Shuttle while its own steady development of manned space laboratories reerived an untimely disappoint-ment in April when the Soyuz ment in April when the Soyuz T-8 manned capsule failed to dock with the orbiting station on Lenin's birthday as planned and had to be brought back to earth.

Leading an industrial revolution

Singapore

commissioning of the engine maintenance and overhaul SINGAPORE'S aerospace indus-try may be relatively modest by Corporation bandled electronics and avionics equipment installaworld standards, but its per formance has pleased both the multinational companies which have set up operations there and the Government, which pinpointed aerospace as a key sector in its so-called industrial revolution which began in the late 1970s.

From the Government's point of view, the industry has all the right ingredients; it is capital intensive, has high value added, offers potential for the transfer of technology and plugs Singapore into the world-wide acrospace system. The Government intends to turn Singapore into the most comprehensive repair centre in the
region and to encourage companies to set up component

Show for the first time this manufacturing.

Several new companie started operations last year and others expanded, despite 2 downturn in demand from the United States, Singapore's

Fixed assets, mainly new contracts from countries of the investment, totalled S\$2.45m in December 1982, up 70 per cent from the year before. Total output increased by 12.7 per cent, while the number of workers employed—3,500—was only marginally higher than in th eprevious year. Some 22 companies, including

General Electric and Sundstrand Pacific, have made Singapore their regional headquarters.

to signing a support agreement for Olympic's engines now sent overseas for maintenance. Training, too, is becoming a profit centre." with sales of this form of service to e number of Mediterranean countries. HAI has training contracts with the Air Forces of Lebanon, Bahrain, and the United Arab Emirates (UAE). The Government is very much in on the act, to compete alongside the multinationals. Singa-pore Airlines (SIA), owned by the Government through its holding company Temasek, has developed a large engineering b Emirates (UAE). Facility to carry out the main-tenance of its own very modern fleet, an electronics workshop

epairs and services autofight of navigation equipment.

SIA recently awarded a £5m amounting to growth of 18 per cent, from \$\$97m in 1982 to and navigation equipment. contract to Britain's Rediffusion

own flight crews and those of other airlines. Its engineering training department also trains technicians and engineers on pro-grammes which run for between

18 months and five years. The Government's other major holding company, Sheng-Li. which comes under the Ministry of Defence, has also set up, under the umbrella of Singapore Aircraft Industries, four companies which maintain, modify, repair and overhaul both civil and military aircraft, including the A-4 Skyhawk, Hunters, Strikemasters, Lockheed C-130 Hercules, Alouette

Simulation for a Boeing 747-300 S\$118m this year. The group is series simulator, to train its making e determined bid to capture military contracts.

One of its companies, Singa-pore Acrospace Maintenance Company (SAMCO) recently won a \$55.3m contract to overhaul eight American naval air-creft, its fourth such contract in the past three years.

Incentives

There is still room for the private sector and every encouragement has been given to major foreign companies to set up their regional operations in Singapore. Incentives include the exemption of the corporate ane exemption of the corporate tax rate of 40 per cent for the first five years of operation, or a concessionary tax rate of 4 per cent on company income derived from export sales. There is also an investment allowance which can be between

10 and 50 per cent and a capital united States without their have assistance scheme under which projects can attract long-term loans at favourable rates.

United States without their having to be re-certified by the American authorities.

The Government remains opti-Board, which has the responsi-

bility for attracting foreign investment to Singapore, has set aside a site at Loyang, near the new Changi Airport, and is constructing new factories for companies which need to begin their commercial operations quickly. So far eight of the factories are ready, three of them with an area of 2,000 sq ft.

> Prospects for the industry were also improved by the sign-ing of e bi-lateral airworthiness agreement between Singapore and the United States in August. 1981. This gave the Singapore Department of Civil Aviation the right to certify that a comlews and requirements and enables Singapore to manufacture parts and components for the

About 14 more will soon be

The Government remains onti-The Economic Development mistie that despite the world-soard, which has the responsi- wide turndown in the aerospace industry, Singapore will tinue to grow, albeit at a slower pace. Growth in 1983 is prosected at around 10 per cent, lower than for the past few years, but still higher than Singepore's overall growth rate which, officiels believe, will bo between 5 and 7 per cent.

Singapore's long-term objec-tives remain the development of the repairing and overhauling aspects of the industry, using Singapore's attractions as an ideal distribution point. Most companies appear to share the view that although times may not be as good in the immediate future. Singapore is poised to take advantage of the upturn in the industry when recovery begins, hopefully in 1984.

Kathryn Davies

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Domestic civil market limited

India

INDIA'S AIRCRAFT manufac-turing programme is limited to military aircraft although Hindusthan Aeronautics makes Hindusthan Aeronautics makes a small trainer called the Pushpak which it has designed itself. The domestic market for civil aircraft is too limited for an indigenous manufacturing programme and there are no plans for export, although Hindusthan Aeronautics is trying to sell the "Kiran" jet fighter to countries "Kiran" jet fighter to countries such as Malaysia for anti-

such as Malaysia for antiinsurgency operations.

The company abandoned
plans to manufacture the
Jaguar under licence from
British Aerospace following the
Indian Government's recent
decision to limit the number
of these aircraft for the Indian
Air Force to 120. Of these 45
are being imported in flyaway
condition and the rest are to be
imported as CRD kits for
asembly by Hindusthan
Aeronautics at its Bangalore
plant.

Its expansion plans depend on the Government's decision on future fighters for the air force. The focus will be on the MiG-27 which is to be built at three plants at Bangalore. Nestk three plants at Bangalore, Nesik and Koraput—originally estab-lished to manufacture the MiGlished to manufacture the Mic-21—and which have just com-pleted making its advanced version, the MiG-21 Bis. The Government has decided to buy MiG-23s and MiG-25s from the

On the civil side, India has three airlines, all of them Government owned. All use imported aircraft, Air India, the international airline, operates a worldwide service based in Bombay with Boeing 707 and 747 aircraft. It is now planning modernisation, beginning with the phasing out of its aging Boeing 707s and, over a longer period, the 747s. A number of aircraft are being studied but no decision has been taken and is not likely to be taken for

Vayudoot, which operates low-Government has decided to buy profit routes, has still to get MiG-25s and MiG-25s from the Soviet Union and go straight to manufacturing the MiG-27, the most sophisticated in the series.

The most sophisticated in the series.

department, though it is close

Indian Airlines has a virtual monopoly of the country's domestic routes — Vayudoot limits its services to small teneconomic routes—and this arnlains its profits. Air-

progress on the GTX, a highly-efficient gas turbine engine developed by Hindusthan Aero-

India's \$1bn 10-year space MiG-23s and MiG-25s from the going but both Air-India and programme got a much-needed indian Airlines have done manufacturing the MiG-27, the most sophisticated in the series.

The most probable Western collaboration will be with Marcel Dassault of France from the Marcel Dassault of The Marcel Dassault of The Marcel Dassault of T

which the Government has already ordered 40 of the sophisticated Mirage 2000 indicated indicated Mirage 2000 indicated indicat

The spacecraft stayed aloft fust five months before being deactivated following moon interference with its earth sensor and a series of complications that followed. A major economic routes—and this explains its profits. AirIndia competes with the world's airlines and its performance refiects remarkable management successes despite high fuel costs.

In aero-engines, work is in development of a second and development insat satellite.

India's space programme made a modest beginning in 1963 at the Thumba equatorial rocket launching station near decloped by Hindusthan Aeronautics research wing. It has been taken for natics research wing. It has been selected by the Government for manufacture of a fighter but the design of the air frame has not yet been chosen. Nepal, Bangladesh, Sri Lanka and the Maldives) uses the Airbus and Boeing 737, and a few Avro 748s manufactured until recently by HA at its plant at Kanpur, Uttar Pradesh. The third airline, Vayudoot, operates Avros borrowed from Indian Airlines in regional services connecting small towns and is planning to buy its own short-haul aircraft.

Vayudoot, which operates low.

way early next year. In the meantime, the second Insat-spacecraft is to be launched by the eighth flight of the U.S. Space Shuttle in the autumn. With this, and the flights planned this year, the space programme should be back on

K. K. Sharma

Airlines struggle with big losses

The fear is that if fuel costs do decline significantly, government pressures to reduce fares may be increased just when a breathing space is. needed.

THE WORLD'S airlines are over the past few years, both to still passing through the worst replace ageing fleets and to recession in their history, meet an anticipated growth Losses incurred by the air transt that in the event has not port industry as a whole during 1982 amounted to about \$2bn, bringing total losses for the period from 1977 to \$5.7bn, with further substantial losses forecast for the current year of over \$2.1bn, For 1984 there

Although there are signs of aengers), high interest rates a upturn in the world and high inflation.

conomic situation, and many These factors include the the airline industry are blocked or delayed transfer

hoping that this will start to be reflected in its results later this year, it is likely to be some considerable time before the industry can pay off the overall. Another has been tandiness of more than Some countries, especially normal fares-fixing machinery of the International Air Transport Association itself.

One estimate has put the cost of discounting to the airline industry at over \$1bn a year iosses of more than \$9bn that will bave accumulated between 1979 and the end of

1984. Most of the losses already incurred or in prospect stem from the very high interest payments on loans for new equip-ment taken out by the airlines Occorred

The airlines' difficult financial situation has also been com-pounded by a number of other major problems, apart from slack or zero traffic growth (leading to over-capacity on is a lower forecast of \$1.40n many air routes with too many losses.

on the part of governments to sanction fares rises to enable the airlines to recoup on rising costs, especially fuel costs. In some cases there has been severe pressure by some governments on airlines to actually reduce fares to meet consumers

demands for cheaper air travel. The current decline in crude The current decline in criste oil prices is already resulting in a stabilisation of aviation fuel prices, and many in the airline industry hope that a period of declining aviation fuel costs may now be in the offing, although it is recognised that this may not be of very great magnitude, or last very long—the overall long-

The fear though is that if fuel The fear though is that if fuel costs do decline significantly, government pressures on the airlines to reduce their fares may be increased commensurately, at a time when the industry needs a breathing space to allow it to catch up with and redress its heavy losses. The airline industry argues that fare levels still beg perhaps as much as \$10n behind the rises in fares needed to offset past rises in

as \$10n behind the rises in lares needed to offset past rises in fuel costs alone.

But there are some other problems that have been largely of the airlines own making. One is the practice known as "discounting" — offening air tickets at prices well below the officially prevailing rates agreed officially prevailing rates agreed either in inter-governmental negotiations or through the

industry at over \$1bn a year-revenues that should have accrued to the industry but which are totally lost.

Monitoring

While strong efforts are now being made to stamp out this practice—by means of a tighter positing of their own activities by the arrines themselves through the IATA's own "Fare Deal Monitoring Group "--pro-gress is slow, and it may be some time before the industry can even reduce the practice to manageable proportions. In many parts of the world, discounting has become almost

last very long—the overall long-term trend in fuel prices being a way of life for some alribras, likely to continue opwards. and even their governments, and since many airlines are not members of the IATA, it is necessary to get governments themselves to agree to help stamp it out.

This is already proving extremely difficult although there have been some success especially in the Far East and Middle East, and the efforts are

If discounting, costing over \$1 bn a year, can be substantially cut down, if not eliminated, and if much of the \$1bn of foreign earnings now blocked could be released, much of the industry's current financial pro-blem could be eased.

include in "fares wars," which achieve little in the way of traffic growth but bleed the participating airlines dry-in some cases almost to death, as the bankruptcy of Braniff in the U.S. and Laker in the UK have

The present battles in the U.S. for traffic on virtually all air routes, as a result of deregulation which has removed government controls on fares policies and because of the volume of competition on the routes, have already resulted in losses of many hundreds of millions of dollars in 1982, with equally heavy losses likely in 1983.

On international air routes government controls remain in force, and the fares battles tend to be smaller in scale, but their effects can be severely debilitat-ing to the airlines' revenues and

This has already been demon-strated on the North Atlantic. It is estimated that in 1982, with close to 50 airlines—both scheduled and charter—flying the North Atlantic between Western Europe and North America, cumulative losses western Europe and North
America, cumulative losses
amounted to more than \$600m.
There is not likely to be much
improvement in the current
year, with further fares cuts
likely this summer, as new "cut
price" airlines such as People Express are launched on to the

blem could be eased.

But there remain other difficulties which are likely to prove much more intractable, One is the industry's propensity of the U.S. Government to engage in such discussions.

One reason for these fares engage in such discussions.

One further problem already arising from all these factors is fill their available seats at any that the airlines are finding it price, reflecting the problem of difficult, if not impossible, to

FINANCIAL RESULTS OF JATA SCHEDULED MATERIAL SERVICES

significant over-capacity now exists. It has been esti-mated that, during 1982, there were over 8.3m empty seats on the North Atlantic, represent-ing the equivalent of as many as 56 empty Jumbo jets flying daily on the route.

0-5 U.S. Dollars Billion

Inter-airline agreements on capacity controls are impossible on the North Atlantic, because of the U.S. anti-trust laws which prevent U.S. airlines from even discussing such matters. Any efforts to control capacity must be left to intergovernment negotiations, but in the past there has been conof the U.S. Government to engage in such discussions. One further problem already

that raise the cash they need to reequip their fleets with new jets to replace their existing ageing incressingly fuel efficient fleets.

It has been estimated that the airlines are not likely to return to profitability until either 1984 or 1985 at the earliest, and that they will need to earn profits of well over \$3bn in 1983 alone to meet actual (aircraft already ordered) or potential re-equip-ment costs. It seems likely, therefore, that even with the ending of the recession, the air-lines will remain in a serious financial situation for a long time to come.

How, then, do the airlines, on the Atlantic routes and elsewhere, climb out of their difficulties? There are several methods, all of which are being tried in one form or another, but many of which could be pursued with considerably greater vigour than at present. In the first place, the airlines themselves must continue to do all they can, with the aid of their governments, to halt the blood-letting of discounting air fares. They must also push their governments to do all they can to end the blocking of the transfers of legitimate earnings from foreign countries. Those two actions alone would do much to correct the current fin-ancial woes of the airline

industry. Beyond that, they must also eek to reduce the over-capacity that is wasting so much of the industry's strength. This is admittedly exceptionally difficult on some routes, such as the North Atlantic, but it is much easier elsewhere, especi-ally in Western Europe, where extensive bilateral agreements govern much of the air trans- necessity to modern the

port operations. But probably far more signi-

need for most airlines to under-take the same kind of severe slimming operations that have been undertaken in the past two years or so by such airlines as British Airways and Pan

At the same time, many air-hings still need to repolish their image to improve their propertuality, reliability and quality of service both in the air and on the ground. The long period of exceptional prosperity and extremely high annual more of growth (10 to 12 per cent) of the pre-recession period undoubtedly generated in the world airline industry an atmosphere of complacency. which ied to mounting criticis of the quality of service, while leaving the sinkines highly vul-nerable to the impact of the

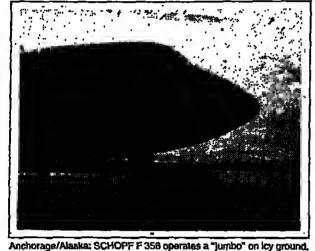
It is difficult to assess the degree of stock which the current recession, with all he problems, has given the industry as a whole, and to individual littlines, but it is clear to practically every air traveller that there is still much to be done. Safety has never been compromised, and remains exceptionally high. But there is still the need for improved punctuality and reliability, for greater skill in ground handling. It is difficult to assess the

ater skill in ground handling (still the number one complaint world wide for most sir travellers), and a greater aware-ness on the part of governments and their agencies (such as Customs and Immigration airposts suthomities and others), that air aravel is no longer a luxury for the few, but a social, economic and even political

-Michael Donne

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Airport business expected to rise

Future developments in the densely-populated countries are likely to be expansions and adaptions of existing airports, bitterly debated by lobbyists and environmentalists.

UPWARDS OF \$80bo is expected to be spent on eirport ground facilities by the end of this century, to adapt airports, air traffic control and ancillary services such as fire services and other emergency services to cope with the anticipated volume of traffic that will follow the end of the recession.

This means that by the end of the century, well over 2bm scheduled service passengers a year will be travelling by air throughout the world, and that if the unmeasured number of non-scheduled passengers is also included, the figure could be as high as 3bn.

Finding ground-room for all these stavellers is likely to pose some major difficulties for air-ports' authorities and govern-

One Abstration of the prob-lem is eveilable in the current debate in the UK into whether

The general belief is that the or not a third major emport for urrent annual total of 765m London should be located at an cheduled service air passengers expanded Stansted Airport, in current cannual total of 765m London should be located at an scheduled service air passengers expanded Stansted Airport, in worldwide will double by the early 1990s, if not before, and that throughout the 1990s, at it is likely to double again.

This current is that leading the form of the facilities at the already saturated Heathrow Airport. Heathrow currently caters for the facilities at the already saturated the standard or the facilities at the already saturated. Heathrow currently caters for close to 30m passengers a year, and is due to cope with up to 38m when the new Terminal Four, now under construction,

is opened.

The argument lies between pushing Stansted up to an initial 15m passengers a year, with provision for further longer-term expansion to a possible meximum of 50m a year well into the next century, or lookand tailding a fifth passenger terminal at Heathrow. This would lift capacity there from the 38m available when Terminal Four opens in 1985, to 53m by the later 1980s.

This highly-controversial problem is the subject of a

problem is the subject of a is costing more than £170m, public planning inquiry, now and Terminal Two at Gatwick under way, which it is hoped over £150m, and these are small

comes a political affair, in the hands of the Secretary of State for the Environment, who is expected to settle the issue one way or another by early 1984.

In the meantime, work on building Terminal Four at Heathrow, to lift capacity at that airport to 38m passengers Heathrow, to lift capacity at that airport to 38m passengers a year from the present 30m, and work on Terminal Two at Gatwick, south of London, to lift capacity there from the current 16m to 25m passengers a year, is now under way. Both those developments, in

their turn, were the subject of major public planning inquiries, major public planning inquiries, bitterly contested by environmentalists, and decided only medial knowledge, and practical civil engineering and other facilities, for the development facilities, for the development of the

that in the densely-populated countries of the U.S. and Western Europe, Japan and some parts of South America, it is probably now virtually im-possible to find any "green-field" site for a new airport where none existed before.

Decisions

In those countries, all future airport developments are likely to be expansions or adaptations to be expansions or adaptations of existing airports, and even those will be the subject of hitterly-contested debate between environmentalists and air transport lobbyists, frequently solved only by direct government intervention, with decisions that probably will never entirely satisfy anyone.

In most of the emerging countries of the Third World, however, this kind of problem either does not exist, or has yet

either does not exist, or has yet to develop into the major en-vironmental issue that has been found in the industrialised and highly-developed countries. It is significant, therefore, that most of the estimated outlay of winning consortium the results \$800m on new airport develop- often lead on to other business ments up to the end of this in the same country. century is to be found in the

possible development of either of this century, and it seems Stansted or a Terminal Five at likely that much of it even. Heathrow, because that is not tasily will have to be paid for yet settled. Nor did it mention by the passenger, through the very large number of programmes now under way throughout the UK at provincial M. D.

airports, where it is estimated that close to £200m is being spent over the next few years in improving up to 28 local-authority owned airports to cope with anticipated traffic expan-Indeed, it is probably impos-

sible to list all the various airport development, improvement and expansion programmes now under way, for there is hardly an existing airport in the world at which some work is not going on to cope with traffic growth, either actual or potential.

Moreover, it is also almost im-possible to list all the various places where new airport developments will become neces sary in the years shead, especially if the current economic recession ends soon, and air traffic resumes its pre-recession upward growth.

Because of the sums involved

—Terminal Four at Heathrow will determine the vexed sums compared with those question of London's future being spent on the new Riyadh airports pattern.

After that, the matter becomes a political affair, in the ing airports is intensely compared to the compared with those or the compared with those or the compared with those questions. many major commercial groups are involved.

Engineering

In the UK, Plessey Airports, part of the Plessey group, the General Electric Company, International Aeradio and Cable and Wireless, are all inof airports in many parts of the world. This is significant, because in

many countries with a limited knowledge of air transport knowledge of air transport affairs, it is necessary to be able to provide a complete package system for aviation development, covering not only the entire design, development, financing and construction of a new civil airport, together with its operation at least for a limited time after its completion, but often also advice a initied time after its com-pletion, but often also advice on the development and opera-tion of the flag airline of the country concerned.

Thus, there has emerged the Thus, there has emerged the concept of a "package" or "turnkey" operation, with consortia of companies linked in one overall airport (and sometimes also airline) development concept, often resulting in close links with the country concerned for many years.

The value of these individual contracts is exceptionally high —in some cases running into

-in some cases running into several hundred million pounds —and as a result they are fiercely contested, while for the Even a £500m ball for the

century is to be found in the Third World.

A recent list of major world airport projects prepared by the National Westminster Bank, detailing more than 30 major civil engineering through to the programmes worldwide involving outlays of more than \$20n, facilities for daily operation. In all probability, IATA's developing world, of which three sitmate of \$80tm is rather on were in the UK (one at Fife, the low side. To generate this developing world, of which three estimate of \$800m is rather on were in the UK (one at Fife, the low side. To generate this one at Gaswick and one in the cash will be a major problem Docklands area of London), and for governments airport author-one in the U.S. ities and the air transport inme in the U.S. ities and the air transport in.

The list did not include the dustry overall through the rest

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Military demand remains strong

Although eash is tight, defence budgets are tending to rise and the emphasis is on conventional weapons and tactical aircraft.

24 m 23 mg

THE STRENGTH of the world's military aircraft markets remains e dominant factor in mains e dominant factor in aerospace manufacturing. Al-though the recession has bitten deeply into civil airliner produc-tion, with a marked diminution in the inflow of new orders, activity in the military aircraft and missile sectors has reand missile sectors has re-mained very high, with strong demand world-wide for combat aircraft, especially of the smal-ler, tactical types.

In many cases, where aero-space manufacturers are en-gaged in both military and commercial aircraft manufacture, the profits earned on the military side are sustaining the commercial divisions and help-ing them survive during the

All the indications are that All the indications are that spending on military aircraft will continue at e high level through the 1980s. In 1980, the spending world-wide on military aircraft was about \$25bn a year (excluding the Soviet Bloc and China, for which figures are not available). By 1985 (measured in 1981)

produce ever-better value for money, with new materials and new technological advances being extensively exploited in the bid to improve combat per-formance with e minimum escalation in cost.

Urgent

which figures are not available).
By 1985 (measured in 1981 prices) this figure is expected to have risen to \$270n a year, and will rise further to about \$300n annually by 1990.
By the end of this century, spending is expected still to be

running at a rate of about improvement in the potential \$35bn e year, and will continue to rise thereafter.

There are several reasons for concentration on the design of

There are several reasons for this rising trend in military aircraft sales. One is the continuing world political instability, generating an increasing desire by emerging countries in the Third World progressively to equip themselves with modern defence equipment, in which combat aircraft of all kinds, but especially of the cheaper, lighter tactical type, figure largely.

Another is the continued programme of improvement in military aviation potential now being undertaken by all of the countries of Neto and others, which is generating a continuing world programme of improvement in military aviation potential now being undertaken by all of the countries of Neto and others, which is generating in them a concentration on the design of new types of sirraft that in crassing the late 1980s or early 1990s, but which will be available interesting types of sirrafts, fhere inevitable can be done by improving existing types of sirrafts, fhere inevitable can be done by improving existing types of sirraft whe late 1980s or early 1990s, but which will be available interesting in them the late 1980s or early 1990s, but which will be available interesting in them are the late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting the late late 1980s or early 1990s, but which will be available interesting in them the late late 1980s or early 1990s.

This is generating in them concentration on the design of sew types of sirraft that late late 1980s or early 1990s.

This is generating in them concentration on the late late 1980s or early 1990s.

This is generating in them con

and the UK eerospace industry (British Aerospace, Rolls-Royce, Marconi Avionics, Smiths Industries, Dowty Smiths Industries, Dowty Group, Ferranti and Lucas Aerospace, among others) with a view to signing a contract for the development of the ECA as a "technology demonstrator," leading, it is hoped, eventually to the development and full-scale production of the ACA itself.

designed to by in 1985, and will
use a great deal of advanced
technology, especially in carbon
fibre and other new composite
materials. It will also incorporate advanced techniques
such as "fly-by-wire" controls, electronic cockpit displays and other developments.

It is intended that the overall airframe structure will be 15 per cent lighter than conven-tional fighter structures because of the use of these edvanced materials.

Collaboration

The big problem in this ven-ture is deciding upon European collaboration. British Aerospace has been involved in discussions mas been involved in discussions with Messerschmitt-Bolkow-Blohm of West Germany and Aeritalia of Italy (its partners in the Tornado multi-role combat aircraft), while the French have also been sounded on the venture.

It is recognised that there is likely to be room for only one major new European combat aircraft type in the late 1980s and beyond, so the coming months are thely to be critical in certifical transfer the vicine to the coming months are the property of the coming months are the property of the coming months are the property of the coming months are the coming months are the coming the company of the company in settling the ultimate inter-national collaborative arrangements on the venture.

British Aerospace believes a "technology demonstrator," leading, it is hoped, eventually to the development and full-scale production of the ACA itself.

The Government's contribution is expected to be between £50m and £70m, but industry has already contributed more than £25m of its own money and will contribute very much more.

British Aerospace believes that during the rest of this century there could be a world market for between 2,500 and 3,000 medium to high-performance aircraft, to replace Phantoms, Jaguars and other combat aircraft. Of these, perhaps as many as 800 to 900 could be Agile Combat Aircraft, of which in turn ebout

The technology demonstrator alreraft (as with the eventual ACA) is intended to be a twinengined combat fighter. 2,500-3,000 medium to his designed to fly in 1986, and will performance jets are potential. one third could be exported.

This is probably a conservative figure, since all of the 2,500-3,000 medium to high-performance jets are potential ACA aircraft, and much depends upon the extent of the competition—especially if there are two aircraft in Europe, the ACA as a UK-German-Italian venture and the French ACX.

The propert of France join-

venture and the French ACX.

The prospect of France joining in any joint European venture for a new combat aircraft for the 1990s seems remote. The French Defence Minister earlier this year told the National Assembly that work on an all-French Experimental Combat Aircraft (called ACX—Avion de Combat Experimental — in France) was heing pushed ahead, with the aim of developing from it an aircraft for ing from it an aircraft for

quantity production by 1990.

The prime contractor for that venture is Avious Marcel Das-sault-Breguet Aviation, drawing heavily on its experience with the Mirage 2000 and 4000 fighter sircraft. The maiden flight of the prototype ACK is expected in late 1985 or early

In the meantime, in the UK work continues on both the work continues on both the Jeguar jet strike-trainer fighter, and on the bigger Tornado multi-role combat aircraft. With orders for 572 Jaguars to dete, of which over 450 bave been delivered, work is currently in hand to meet the remaining requirement for components for Jaguars to be assembled in India, and on production for Oman and an undisclosed oversess customer. With other seas customer. With other orders now in negotietion, Jaguar production is assured until 1986 at least.

With firm orders placed for With firm orders placed for 647 Tornado jets, out of the 805 planned, so far just over 200 have been delivered, including over 100 to the RAF, 31 to the West German Air Force and Navy and 19 to the Italian Air Force.

Included in those ordered to date are 70 of the more advanced Air Defence Variant (ADV) especially for the RAF. At current levels of production of ebout 110 aircraft a year in the three participating countries (the UK West Germany and (the UK, West Germany and Italy), the Tornado programme will come to an end in 1989, unless export orders or addi-tional air force orders in West

Europe emerge.
Also in the UK, the RAF is now studying plans for a new In the meantime work on of tactical combat aircraft that basic trainer to replace its building the AV-SB continues will be smaller, lighter in ageing Jet Provosts, and an Air steedily. Four full-scale develop- weight, and less costly, but

Maryland, and Edwards Air Force Base, Californie, and McDonnell Douglas is now building 12 pilot production AV-8Bs et St Louis. The U.S. Marine Corps plans to take delivery of the first of those in the coming autumn.

The second prototype of Northrop's F-20 Tigershark, On schedule for a first flight this antumn, it is being assembled with significantly fewer man-hours than the first aircraft

sonic V/STOL design.

A number of other U.S. com-

The object is to refine a

design for a future generation

next generation trainer.

Some turbo-prop trainer manufacturers will be bidding also, including Beech of the U.S. with the T.34C, Embraer of Brazil with the Tucano, Pilatus of Switzerland with the PC-7, Slai-Marchetti of Italy with the SF-280TP, NDN Aircraft of the Isle of Wight with the Turbo-Fireeracker and the West German RFB with its Fantrainer. the coming autumn.

Full-scale production calls for np to 338 aircraft for the U.S. Marine Corps, with 60 aircraft (called GR Mark Vs) for the RAF. British Aerospace and Rolls-Royce (in conjunction with Pratt & Whitney) are associated with McDonnell Douglas on the AV-8B venture, as well as on the new supersonic V/STOL design.

Emphasis

Fantrainer.

In the U.S., considerable design emphasis is now being placed on new combat aircraft for service in the 1990s. McDonnell Douglas, which is multi-million dollar contract to multi-million dollar contract to build two "forward swept Harrier II vertical take-off aircraft for the U.S. Marine Corps (and for the RAF), in conjunction with British Aerospace, is now also designing a facility. The cash is coming space, is now also designing a Calverton, Long Island, test single-engined vertical and facility. The cash is coming short take-off and landing air from the Defence Advanced craft that could become the Research Projects Agency. first V/STOL aircraft to fly et supersonic speeds.

Staff Target setting out the requirement is expected to be fight-tested at the Neval Air issued soon. British Aerospace Test Centre, Petuxent River, will be bidding with its P-164 Maryland, and Edwards Air design, but Fairchild of the U.S. Force Base, Californie, and will also be in the fight with its T-64A, now under development as the U.S. Air Force's next generation trainer.

Some turbo-prop trainer

ment aircraft are already being more efficient than contemporary fighters.

General Dynamics, another current basic programme is the F-16 in various versions, is working on a private-venture advanced version of thet aircraft, the F-16XL, incorporating delivery of the first of those in working on a private-venture advanced version of thet air-craft, the F-16XL, incorporating new aerodynamic and systems technologies.

Northrop, another well-known fighter builder, has built its new F-5G tigershark, designed to be a comparatively low-cost fighter for export to countries of the Third World.

Also in the U.S. Rockwell International is developing the new B-1B long-range strategic multi-role swinging-wings supersonic bomber, under massive contracts already worth over \$2bn. The B-1B, hased on the original B-1 supersonic bomber of the late 1960s and early 1970, which the trace is the supersonic full state of the late 1960s and early 1970. which never went into full production, will incorporate much advanced technology.

Two of the original B-1 prototypes are being used in the overall development programme, but the first new production B-IB is scheduled to fly late next year or early 1985, with delivery to the U.S. Air Force in 1985, and the total U.S.AF order of 100 aircraft expected to be completed by

Michael Donne

Importance of missiles grows

Over the decade to 1992, the world is expected to spend between \$75bn to \$100bn on tactical guided weapons.

THE DESIGN AND manufacture of guided weapons and missiles occupies a central place the rest of the century.

The sector is important as a Dynamics' Tomahawk focus of some of the most adany industry, using design skills in advanced micro-electronics, circuit design and in miniaturisation of control techniques.

Many of these advanced tech-nologies are expensive and guided weapons manufacturers have developed internation co-operation and co-production arrangements to help offset the high costs. Several multi-million douar programmes are in progress in Britain, France, Germany and the U.S. Other countries in Europe are also involved.

These collaborative programmes have helped to ensure the wide spread of guided weapons for defensive and offensive purposes through the armed forces of the nations in-volved. At the same time, iong production runs have contri-buted to the reduction in unit cost and helped in the cause of standardisation of weapons in the North Atlantic Treaty Organisation.

in military terms, the importance of guided weapons is unquestioned. The Falklands war last year demonstrated bow much contemporary armed forces depend on missiles for the rapid achievement of military objectives.

tary objectives.

Both sides in the Falklends conflict achieved considerable successes with guided weapons—the British Aaruspace Rapier anti-aircrfat missile bringing down many Argentine combat aircraft, while the Argentine Air Force, using the French-built Exocet air-to-surface missile, sank the guided missile destroyer Coventry, and the merchant ship Atlantic Con-veyor. There has since been a marked upsurge in foreign military interest in both mis-siles, which is expected to lead to increased sales.

Accuracy

guided weapon technology in terms of accuracy, "electronic intelligence," miniatorisation and speed, bas forced the designers of aircraft weapon platforms and land-based attack and defence systems to design

The U.S. and other western countries with defence indus-

tifes are expected to spend a total of \$7.9on on all types of tactical guided weapons and missiles in 1983. Over the decade to 1992, a total of between \$7500 and

similar to that expected to be spent by the U.S. alone on its strategic missiles programme over the same period.

The ASRAAM is being air divisor of BAe Dynamic further developments in the divisor of BAe Dynamic further developments in the same period.

The ASRAAM is being air divisor of BAe Dynamic further developments in the divisor of BAE Dynamic further dev

Spending in the U.S. in the 1983-84 financial year alone on missiles of various types is planned to amount to several billion dollars, including \$3.3bn on continued research developand procurement of the General Boence.

guided weapons industry in almost the same league as the commercial airliner sector of the aerospace industry, with the U.S. has "called e halt" is a smerior missile. It is

Bodenseewerk (BGT), the lead contractor in

. The AMRAAM is being developed by the U.S. with Hughes as the lead contractor. ment and procurement of the The proposed developments U.S. Air Force's MX strategic are based on memoranda, of interconfinental ballistic mis- understandings signed by the missles occupies a central place sile, over \$650m on further in the aerospace industries of the Western world and is set to grow in importance in military and commercial terms invegen and over \$400m on development and procurements the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and over \$400m on development to grow the rest of the Terms invegen and the Terms

total sales of \$126bn expected to further development of air-to be spent in the ten years to launched short-range agile defensive missiles beyond the



the feasibility or project definition stage.

At the same time, a number of major projects that will provide work for Western aerospace companies in the interim are close to being finalised, with several decisions pending by defence departments, and work is continuing on the wide reneal. is continuing on the wide range of weapons and systems already in existence or nearing the full The rapid rate of advance in production stage.

In Europe and the U.S., much attention is focused on the proposed new generation of air-to-tir missiles. These are to be developed and may be sold on a "two-way-street" basis between the Governments their systems increasingly of Britain and Germany on one around the capabilities of side and the U.S. on the other. guided weapons. Two missile projects are in-These are no longer mere volved. The two European These are no longer many appendages to the carrying countries are to develop an appendages to the carrying countries are to develop an aystem, but are themselves the advanced showt-range air-to-air missile (ASRAAM) and the U.S. is to develop a new advanced medium-range zir-to-air missile (AMRAAM).

The programmes are complementary and are part of a planned rationalisation of future air-to-air missile design, development, production and procurement by the three \$100tm is expected to be spent governments. The aim is to by the U.S. and the rest of the share costs, avoid deplication world on tactical guided of effort and provide a large weapons, according to U.S. common market for the sources in estimates made last missies, with atandardisation a year. This scale of spending is crucial consideration.

Rapier: value proven during the Falklands War British Aerospace's

The volume of work on current Sidewinder range to guided missile programmes is see if Europe, and in particular already considerable and much Britain and Germany in partof the spending on new pro-grammes into the 1990s is a missile over the heart decade, already being planned, either at the feasibility or project defini-tion the last decade, and the feasibility or project defini-tion the last decade, and the last decade, already being planned, either at the feasibility or project defini-

British Aerospace is still at the feasibility study stage with the ASRAAM and no final soluthe ASRAAM and no final solutions have been agreed, but BAe would prefer to opt for a completely new type of missile. This would be made possible by edvances in miniaturisation and control techniques and involve the choice of hypersonic (many times the speed of sound) velocities in a "hittile" type of guided weapon. This would have little or no warhead and would destroy its aircent target by actually hitting it. by actually hitting it.

BAe expects to start produc-tion of ASRAAM by the late 1980s with the missiles entering service before 1990. However, the ASRAAM pro-

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Further developments in elec-tronics and the military need Geratechnik alreaft to defeat enti-Geratechnik alreaft defences, have led to contractor in the development of new "enti-rediction" missiles. These are guided weapons designed to destroy enemy radar sites by beaming in on the radar emissions from the ground.

British Aerospace has pro-posed to the British Ministry of Defence its air-launched antithree governments. Under these agreements, the European partner and the U.S. will each have the right to produce both missiles. Where appropriate under ficence.

Britain and Germany are expected to buy the AMRAAM is still at the development stage and is understood to be between the U.S. and in turn, the U.S.

claims that its ALARM weapon
is a superior missile. It is
t of airagile only half the weight of HARM.

BAe has warned-that if the
British Government does not award it the contract, 700 staff will have to be made redundant, but if it does go shead, 2,800 jobs in design and production will be secured over the 10-year period of the missile's design

Export markets

ALARM would also possibly involve German manufacturers as well as Marconi in Britain, which is expected to build the seeker head for the missile.

BAe is likely to produce a minimum of 2,000 ALARM missiles with about 750 missiles going to the Royal Air Force. The rest would be sold to export markets in an attempt by BAs to win a share of the estimated world market for between 15,000 to 20,000 enti-radiation missiles. A great deal is at stake, for BAe and for the 13 other major British sub-contrac-tors involved in the ALARM

In the field of ground-isunched missiles, the Euro-missile Dynamics Group (EMDG), formed by British Aerospace, Aerospatiale of France, and Messerschmidt Bolkow Blohm of Germany, is co-ordinating the development of a third generation of antitank missiles (Trigat). The group is now negotiating e pro-ject definition contract. This is expected to be awarded this This will be a medium-range

laser beam riding missile to replace the MHan anti-tank missile from the early 1990s and a longer-range passive infrared homing missile to replace Hot and Swingfre missiles in the mid-1990s. A massive production run for these missiles is expected.

these missiles is expected.

The second major land-based missile project getting under way in Europe and the U.S. is the Multiple Launch Rocket System (MLRS).

The first version of the MLRS is already in service with the U.S. forces. MLRS II is being developed by Vought for Germany, but is not in service.

MLRS III is under consideration by competing consortia, led by by competing consortia, led by General Dynamics and by

Hughes respectively.

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transport now flying worldwide with over 40 operators. Manufacturing and developing the Uni /d Kingdom's most

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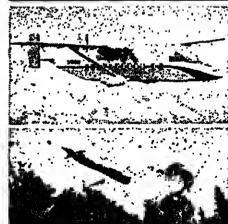
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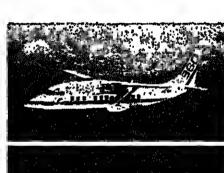




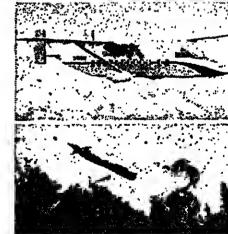


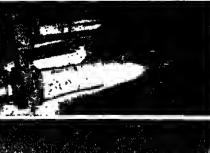














Space technology expanding rapidly

Between now and the end of this century at least another 200 to 300 commercial satellites of various kinds will be put into Earth orbit.

WHILE A substantial part of the world aerospaca industry has been suffering from the recession, one arena—that of space—has been expanding et a dramatic pace. Although the era of space technology is little more than 25 years nid, it has evolved rapidly from the first Soviet Sputnik satellite of 1957 through to tha highly complex manned reusable space transport system of today, NASA's Shuttle, that is capable of carrying into space and launching satellites on its own.

While military space develop-

While military space development covers satellites for defence communications and other purposes, and is largely secret, civil and commercial space technology covers several broad fields in its own right: deep space probes that are designed to discover more about the solar system and about the Earth's space environment; scientific satellites that are intended to discover more about the near-Earth environment; and "appli-cations satellites" that are intended to put space tech-nology to work. Examples incinde telecommunications, weather forecasting, Earth resources monitoring and many

Of course, many more space- space stations in permanent 1990s, craft than these bave been orbit round the Earth, with In launched over the past 25 years

(including the new arena of "direct broadcasting satellites"), but also including many for nical delays, the turn-round times for the Shuttla bave been an estimated outlay of at least \$60n.

overall anticipated spending on commercial space activities through the next 17 years is likely to be more in the region of \$20bn to \$30bn.

Competitive

Space has thus already become big business, and is ex-pected to become even bigger. At the same time, it is also becoming ever more fiercely competitive, as more and more companies in more and countries vie with each other for system and belp achieve as soon the business available in both the space and ground hardware.

system and belp achieve as soon as possible the target of commercial reliability and hence

Prospects for the increasing also viability.

commercialisation of space have been considerably enhanced as a result of the development in and that before the end of this Activity in all these fields has been expanding. By the end of the US of the mauned, reusable space Transport System (STS), generally known as the Shuttle.

4.800 spacecraft of various types in orbit, of which about 4.750 were in Earth orbit, 16 were in mrbit round the moon and 36 in solar or inter-planetary orbit.

Of these, in turn, the U.S. of the devetopment in the US of the mauned, reusable Space Transport System (STS), generally known as the Shuttle.

The system is already beginning to show that in time, it will become an invaluable means of launching satellities of all kinds, and other payloads, and a rate of 10 to 12 a year by the later 1980s does not seem an impossible amilition, rising day of constructing manned that before the end of this decade Shuttle launches will have become a regular feature of U.S. space activity. The only question is bow long it will means of launching satellities of all kinds, and other payloads, and a rate of 10 to 12 a year by the later 1980s does not seem an impossible amilition, rising rapidly thereafter through the

launched over the past 25 years or so, but many have either mainfunctioned, or completed their duties and fallen silent, while still in space, or burned up on re-entering the Earth's atmosphere at the end of their missions.

The current average annual rate of spacecraft launches of all kinds runs to about 50 worldwide, if military spacecraft are included (the numbers are not clear, for many of such launches are never publicised), parts flown up by a aeries of shuttle launches.

Already President Reagan has called for a study into the possible development of a permanently-based manned space manned space manned space which would help the station, which would h

launches et e rate of about one satellite payloads although some every two weeks, using both the scientific satellites are also Cape Kennedy, Florida, and Vandenberg, California, launch-

early developmental phases of such a complex and expensive system it is better to be safe than sorry.

It is recognised by NASA that these turnround times must be substantially improved, without in any way prejudicing the safety of astronauts, vehicles or payloads, before the Shuttle can become commercially viable.

Much work is now being done
in the U.S., not only by NASA,

in the U.S., not only by NASA, but throughout the aerospace industry which has designed, developed and built all the myriad parts of the intricate Shuttle system, to improve the system and belp achieve as soon

In the meantime, a beavy parts flown up by a aeries of reliance is still placed by pros-Shuttle launches. reliance is still placed by pros-pective commercial and other

launches are never publicised), costs of development and main- two commercial communica-but the total of commercial tenence and whether inter- tions satellites from Shuttle

involved.

Similarly, in Western Europe development of the conventional Arlane rocket launcher vehicle, has had its difficulties, with the failure of the L5 launch last autumn. As a result, the European Space Agency has now revised its programme, with L6 now set for launch in early June, to be followed later in the year by L7 in August. in the year by L-7 in August, L-8 in November, and L-9 next

January.
Of these, L-6 will launch the European Communications Satellite (ECS) and the Ament (Radio Amateur Telecommuni-cations Satellite). The L-7, L-8 and L-9 launchers have been assigned to the launching of the big Intelsat V satellites for the International Telecommunica-tions Satellite Organisation.

spacecraft is much lower, although it is now expanding annually.

Most of the latter are satalities for communications (still the biggest single function for near-Earth satellites), followed by weather forecasting and Earth resources monitoring—a now rapidly expanding field in its own right.

It is estimated that between now and the end of this century, at least anniher 200 to 300 to 300 the latter are satalities of various at least anniher 200 to 300 t spacecraft, each of up to 1,195 kilogrammes, into geostationary

transfer orbit. Trends

It is intended that the European Space Agency's ECS-2 and the Marcos B-2 communications satellites, together with the French statellites Telecom 1A and B, and the Arab League's satellite. Arabsat-1, as well as the U.S. commercial satellites. Western Union's Wester-6 and Southern Pacific's Spacenet-1 and 2, will all be launched in the near future by the Arlane 3
Because trends will require
the launching of even bigger
payloads from the mid-1980s on,

able in several versions, capable of putting payloads of between

into Earth transfer orbit.

This flexibility of launch vehicle availability will enable a wider variety of payloads to be accommodated, keeping the "occupancy rate" of the launcher at a high level. The first test launch of an Ariane 4 is expected in the second balf of 1985, and it should be operational from 1986 onwards, with among its likely first payloads the very large Intelsat VI series of communications satellites.

At the same time, in speed

At the same time, to speed the launching rate of Ariane rockets, and cater for the bigger rockets, and cater for the bigger versions of the Ariane now on tha way, the European Space Agency is building a second launching platform at the present launching base at Kouron in French Guiana. This will enable one Ariane to be readied for launch while another is being sent off into space, and it is expected that this will reduce the intervals between launches to one month. between launches to one month. This improved launching rate will become necessary because the revised schedule now drawn up for Ariane envisages a total now developing a more powerful of nearly 20 launches na total version still of the Ariane, the end of 1985, putting nearly 40 Series 4. This will become available in several versions, capable orbit, of which the majority will

Artist's impression of UNISAT, the broadcasting satellite for the UK which will provide two channels of television

one kind or another. one kind or another.

Conscious of the need to compete with the Shutila, by providing a viable alternative launching system for those countries or commercial customars who for one reason or another do not wish to use the

the possible immcher configurations themselves are still being studied.

pete with the Shuttla, by providing a viable alternative launching system for those countries or commercial customars who for one reason or another do not wish to use the U.S. facilities, the European Space Agency is now studying what to do beyond Ariane 4.

A new engine, using liquid ozygen and liquid hydrogen, and giving 90 tomes of thrust, has been selected as a key element in the future launch system, but

Military satellites gather intelligence in secret war

space have been exploited since the first Sputnik was launched over a quarter of a century ago, on October 4, 1957. Both the U.S. and the Soviet Union have made and still make, extensive use of satellites, primarily for communications or surveillance purposes, but many of the satellites that are launched for military purposes are either not publicised, or if so, their precise tasks in Earth nrbit are never revealed.

Many of the planned launches of the new U.S. Space Shuttle system through space Shuttle system introngate tha 1980s are intended to carry payloads for the Department of Defence, primarily satellites for a wide range of tasks—communications, surveillance, missile tracking and other purposes.

These roles include photographic reconnaissance, nuclear blast detection, electronic intelligence gathering, navigational aids for military

aircraft and ships, military weather forecasting, and ex-tensive aerial mapping. So far as is known, neither the U.S. nor the Soviet Union have yet actually resorted to the deployment of weapons aboard spacecraft, but the longer-term eventual possi-hilities of such activities cannot be ignored.

Even without such use of spacecraft as weapons plat-forms, however, it is clear that in any future bostilities, the enemy's spacecraft must be prime targets if only because of the communications, surreillance and other "non-shooting" but nonetheless vital uses to which they are put. The development of techniques to detect those uses is thus a vital element in this continued escalation of the military uses of space.

Some time ago, the U.S. Air Force set no a Space Command to take over all the military activities evelving from the exploitation of this new frontier of technology, and in the recent past its acti-vitles have been substantially extended.

Among its current studies are plans for the eventual development of a "space-te-space" reconnaissance sys-tem, to detect hostile satellites from afar; development of a warning laser receiver for U.S. military satellites; and evasive manoeuvring techniques for satellites and other spacecraft.

Although little has been published about their activi-ties in the West, it is be-lieved that Soviet satellite scientists are working along similar lines, as Mr Caspar Weinberger, U.S. Defence Secretary, sald recently in his report on Soviet military DOWEL.

Mr Weinberger's report suggested that the Soviet Union could launch the first prototype of a space-based auti-satellite laser system in the late 1980s or early 1990s,

while an operational system capable of attacking nther antellites within a few thousand km range could be established in the early 1990s.

On the ether hand, space-based anti-ballistic missile systems would be more diffi-cuit and expensive te davelop, but could be tested in the 1990s, probably becoming operational around the turn of the century.

of the century.

The Soviet Union is known to be building bigger and more powerful rocket vehicles that could give it the capability of deploying large weapons systems in near-Earth orbit, although it has not yet developed a system approaching the U.S. Space approaching the U.S. Space Shuttle manned, reusable space transport system. This steadily-emerging mili-

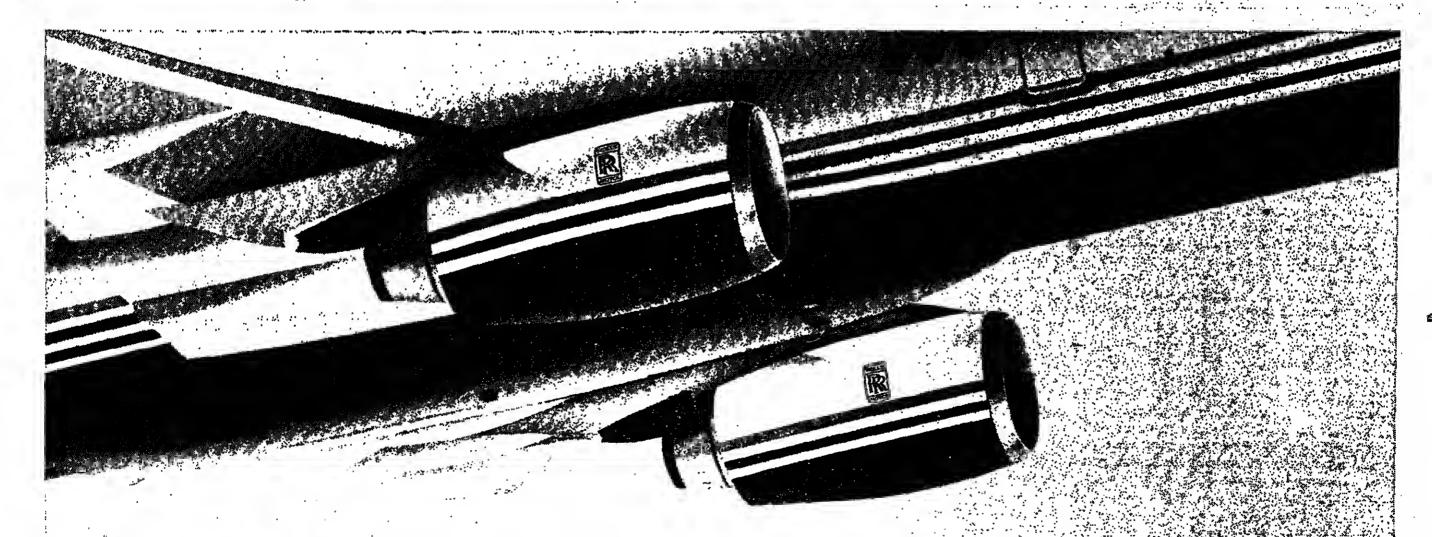
tarisation of space was given added point by President Reagan's speech earlier this spring, when he called for definition studies for a longterm "space defence pro-gramme", designed to ensure

that the Free World was not nvertaken by Soviet military space developments.

Although President Reagan's speech was criticised by some, it was widely accepted in the defence industries as indicating a proper awareness of the vast potential of space as a future battleground, with a determination to ensure that the U.S., on behalf of itself and its allies, did not get left behind. The U.S. is determined "not to surrender the high ground of space" to the Soviet Union.

Subsequent to the President's speech, it is expected that available funds for military research, development and exploitation of space will expand. Spending on anti-satellite space laser systems, for example, is expected to rise to over \$500m annually by 1987-88, while the USAF's space surveillance research will rise to over \$100m a year

M. D.



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